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Toni Maglica*, Ina Reić Ercegovac & Maja Ljubetić

FAMILY CHARACTERISTICS AS DETERMINANTS OF MENTAL HEALTH IN ADOLESCENTS

(Received: 18 July 2020; accepted: 13 May 2021)

The family environment is considered to be a micro-ecological system with numerous risk and protective factors for mental health. The goal of this research was to determine how different functional and/or structural family characteristics affect some indicators of mental health in adolescents. A number of 1,239 adolescents (ages 15–19) participated in the research. General Data Questionnaire, Family Life Satisfaction Scale, Family Communication Scale, Positive Mental Health Scale, Anxiety, Depression and Stress Scale, and Stressful Events in the Family Checklist, were applied. The results indicated no connection between sociodemographic characteristics and self-assessed satisfaction. Adolescents with older parents were less satisfied with their family and familial communication. Gender differences in mental health were confirmed, mostly to the detriment of girls. The mother's age and the father's level of education significantly correlate with individual mental health. Adolescents with older mothers reported lower mental health. Adolescents with fathers of lower educational status reported higher stress and depression level. Stress within the family proved to be significant in explaining adolescents' mental health, especially due to financial issues, and conflicts among family members. Finally, the results indicated that family communication and satisfaction, with the control of sociodemographic characteristics and stress in a family, additionally explain the significant part of the variance in adolescents' mental health.

Keywords: family communication; family satisfaction; adolescents; mental health; internalized problems

1. Introduction

Mental health is an integral and essential component of the entirety of human health understood as a wholeness of physical, mental, and social well-being, and not merely as the absence of disease or weakness. It enables individuals to realize

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their potential, productivity, possible contribution to the community they live in and to adequately cope with everyday stressful situations (WHO 2014a). Various factors affect mental health, and there are periods of life when the risk of mental health issues is increased. Adolescence is, along with pregnancy and childhood, one of these periods, especially when one considers that most mental problems occur before adulthood (Campion et al. 2020; Campion 2019; Jones 2013). The mental health of adolescents is of particular interest to practitioners and scientists because the period of adolescence encompasses strong and growing changes and formative learning experiences that occur during the transition from childhood to adulthood. During this period, adolescents must navigate their way through overwhelming experiences and feelings of uncertainty, while at the same time they discover new skills and competencies that may be carried through the rest of their lives. Recent neurological evidence underlines the importance of adolescence as a period that can have long-lasting impact on life trajectories because of the rapid structural and neuro-developmental changes that take place in the brain during this period (Dahl et al. 2018; Sheehan et al. 2017; Patton et al. 2016; Sloboda & Petras 2014). Despite the above statements, Ordóñez and Collins (2015) think that adolescent mental health is still neglected in the wider mental health context and that additional research should be conducted. For example, when it comes to adolescent mental problems, Erskine and colleagues (2017) state that global prevalence data is still scarce. Yet, what we know is that a significant percentage of adolescents exist who manifest mental health problems (Polanczyk et al. 2015), and World Health Organization data show that adolescents aged 13–18 years are manifesting anxiety problems (more than 20% of youth), depression (10–15% of youth) and suicide is the second leading cause of death in people 15–29 years old (WHO 2014a); i.e., it is the first pattern of mortality in young girls aged 15–19 years (WHO 2014b). An ecological model (Bronfenbrenner 1979) is often used to explain mental health (even mental health problems), enabling a better understanding of adolescents' relationships with their environment, and the interaction of their risk and protective factors. For this paper, the research focused on certain characteristics of the family as the closest environment within the ecological model and their impact on mental health, as well as on some of the mental problems specific to adolescents.

Parents are undoubtedly the key gatekeepers to the mental health of adolescents (Schnyder et al. 2019); therefore, it is extremely important to explore the relationship between parenting and adolescent mental health. The obtained results contribute to the development of preventive strategies (Van Loon et al. 2014), but also to the promotion of mental health. Previous research findings have shown that quality family relationships, familial cohesion, satisfaction within the family and quality communication are family protective factors that protect mental health, contribute to an individual's sense of well-being and prevent behavioural issues (Alm et al. 2020; Reed et al. 2015; Lutahr & Zelazo 2003; Masten 2001, as cited

in Velez et al. 2019). When it comes to communication, the importance of quality in communication processes and family interactions has been the topic of numerous studies (Epstein et al. 1993; Haskard et al. 2009; Peterson & Green 2009), with the following highlighted as key aspects determining the quality of family relationships and familial functioning: active listening (Hafen & Crane 2003; Mcnaughton & Vostal 2010; Weger et al. 2014), appropriate manners of conversation and problem solving (Akhlaq et al. 2013; Ahmadi et al. 2010), control of expressing negative feelings (Morris et al. 2011) and freedom in mutual expression of affections and emotions (Liu et al. 2015; Čotar Konrad 2016). The use of active listening is the first step in an effective two-way communication and successful cooperation among family members, especially in the parent-adolescent relationship, enabling both information gathering and showing interest in the other party (Mcnaughton & Vostal 2010). Studying the (in)effectiveness of active listening and the consequent effects on family practice, Hafen and Crane (2003) emphasizes that one of the intervention measures in family therapy should be to teach parents about active listening. According to research results, the reason for this is that with communication being based on active listening, the recipient of the messages feels better (Weger et al. 2014), and this aspect is extremely important – especially when it comes to communication between parents and adolescents. On the other hand, poor family relationships, lack of cohesion, and inadequate communication remain family risk factors that are associated with many mental disorders throughout life, addiction, and even psychiatric disorders (Ballester et al. 2020; Berg et al. 2017; Landstedt et al. 2015; Morgan et al. 2012).

The goal of this research was to examine the contribution of different structural and functional family characteristics to adolescents' mental health, and internalized problems that adolescents manifest. Regarding the aforementioned goal, this study tried to answer the following research questions:

1. The relationship between the sociodemographic characteristics of adolescents and their families, family satisfaction and familial communication, and the mental health of adolescents.

2. Whether adolescents differ in self-assessment of mental health, depression, anxiety, and stress concerning gender, age, and the type of school they attend?

3. Whether satisfaction with family relationships and communication contributes to adolescent mental health in addition to the contribution of sociodemographic characteristics and experiences of stressful family events?

2. Materials and Methods

2.1. Sample

The research included 1,239 adolescents aged 15 to 19 years, 7.28% of them students of two-year and three-year vocational secondary schools (N = 92), 49.17% four-year and five-year vocational secondary school students (N = 621) and 43.55% were grammar high school students (N = 550). The sample's structure according to age and gender is shown in *Table 1.*

Table 1
Sample structure by age and gender (N = 1,239)

	15 years	*16 years*	*17 years*	*18, 19 years*	*Total*
Male	121	172	159	117	569
Female	135	178	182	175	670
Total	256	350	341	292	**1,239**

In the entire sample, more than 98% of adolescents live with their mothers (N = 1,216) and 87% with their fathers (N = 1,074). The majority of participants, 83.70% (N = 1,053) stated that their parents live together in a marital relationship, while 107 adolescents (8.47%) stated that they had experienced parental divorce. The average age of the mothers was M = 45.13 (SD = 5.12) with their age ranging from 30 to 70 years; the average age of the fathers was M = 48.64 (SD = 5.80) with an age range of 33 to 70 years. Shown in *Table 2* is the structure of parental categories according to the level of education and employment status at the time of the survey.

Table 2
Parental education and working status

Education	*Mother*	*Father*	**Working status**	*Mother*	*Father*
Elementary school	2.40%	2.82%	*Full time*	73.6%	79.50%
High school	55.80%	57.02%	*Short-time work*	9.81%	6.05%
Bachelor's degree	13.21%	12.98%	*Unemployed*	13.96%	2.82%
Master's degree & <	28.58%	27.18%	*Retired*	15.75%	10.33%
			Other	0.88%	1.29%

2.2. Instruments

The following instruments were used in the research: General Data Questionnaire for students, Family Satisfaction Scale, Family Communication Scale, Positive Mental Health Scale, Depression, Anxiety and Stress Scale and Stressful events in the family checklist. The measures were either translated from English and validated in previous researches on Croatian samples (Maurović et al. 2020; Novak et al. 2021) or constructed in Croatian.

General Data Questionnaire collected data on the participants' basic sociodemographic characteristics (gender, age, grade, type of school) and their families' basic sociodemographic characteristics (household members, parents' age, parents' educational and work status, parents' marital/partner status).

Family Satisfaction Scale is an integral part of the FACES IV instrument (Olson et al. 2006). It consists of ten questions that address the positive aspects of family relationships (e.g., closeness between members, ability to resolve disagreements, etc.); the task of the participants was to assess (on a scale from 1 to 5) levels of satisfaction where 1 meant very dissatisfied and 5 very satisfied. Confirmatory factor analysis showed a good fit of the data to the one-factor model (GFI = .90; CFI = .94; NNFI = .93), hence a total score was formed as a linear combination of estimates on all ten items, with a higher result indicating higher family satisfaction. The scale's psychometric characteristics are shown in *Table 3*.

Family Communication Scale is an integral part of the FACES IV instrument (Olson et al. 2006). It consists of ten items that examine various positive aspects of communication within the family (e.g., calm discussion of problems, honest expression of emotions, etc.), and the task of participants is to assess on a scale from 1 to 5 the degree of agreement with each particle where 1 means 'I completely disagree', and 5 'I completely agree'. Confirmatory factor analysis showed a good fit of the data to the one-factor model (GFI = .93; CFI = .96; NNFI = .94); therefore, one total result was formed as a linear combination of estimates on all ten items, with a higher result indicating better communication in the family. The psychometric characteristics of the scale are shown in *Table 3*.

Depression, Anxiety and Stress Scale (Lovibond & Lovibond 1995; Reić Ercegovac & Penezić 2012) originally consists of 42 items arranged in three subscales which examine the level of depression (pessimism, inability to feel positive emotions, etc.), anxiety (breathing difficulties, anxiety, panic, etc.) and stress (inability to relax, irritability, etc.). An abbreviated version of 21 items was used in this research, with each subscale represented by seven items. The participants' task was to evaluate on a scale from 0 to 3 how much each item referred to them in the last week. At the same time, 0 meant 'It did not refer to me at all', and 3 meant 'It strongly referred to me', i.e., 'It referred to me most of the time'. Confirmatory factor analysis on predefined three factors showed a good fit of the data to the

three-factor model (GFI = .92; CFI = .94; NNFI = .93); therefore, three total results were formed, and their psychometric characteristics are shown in *Table 3*.

The Positive Mental Health Scale (Warwick-Edinburgh Positive Mental Health Scale, Clarke et al. 2011) consists of 14 items that encompass behavioural and affective aspects of an individual's mental well-being (e.g., relaxation, interest in other people, self-confidence, etc.), and the task of participants is to rate on a scale of 1 to 5 how often they felt, behaved, or thought the stated way during the previous two weeks where 1 meant 'Never' and 5 'Always'. Confirmatory factor analysis on a predetermined single factor, following the instructions for using the scale, showed a satisfactory fit of the data to the one-factor model (GFI = .89; CFI = .90; NNFI = .89) and formed a highly reliable total result, the higher value of which indicates the participants higher level of mental health. The scale's psychometric characteristics are shown in *Table 3*.

Stressful events in the family checklist was constructed for research purposes and consisted of several stressful events that participants were required to mark if they experienced them in the family. These were parental divorce, financial problems in the family, domestic violence, significant disagreements between parents and significant disagreements between adolescents and parents.

Table 3
Psychometric characteristics of the used instruments

	N	*Cronbach α*	*M (SD)*	*Range*	*skewness*	*kurtosis*
Satisfaction with family	10	.95	38.73 (9.20)	10–50	-.94	.43
Family communication	10	.94	39.30 (8.73)	10–50	-.84	.31
Depression	7	.89	6.07 (5.42)	0–21	.90	-.08
Anxiety	7	.85	5.98 (5.22)	0–21	.90	.01
Stress	7	.88	7.62 (5.55)	0–21	.52	-.69
Mental Health	14	.93	52.19 (10.37)	14–70	-.55	.05

2.3. Procedure

The data presented in this paper are part of a larger scientific research within the *Positive Development of Croatian Adolescents project* [original title in the Croatian language: *Pozitivan razvoj mladih u Republici Hrvatskoj*], led by Dr.

Miranda Novak, Faculty of Education and Rehabilitation Sciences, University of Zagreb. The research was conducted upon informant consents and in accordance with respecting all ethical standards. It was conducted in schools, i.e., during classes that the respondents attend, on the paper-and-pencil principle. Participation in the research was entirely anonymous and voluntary, and the students who agreed to participate signed an informed consent letter. Completing the questionnaire took approximately one school hour.

2.4. Data analyses

Data were analysed using the statistical application STATISTICA13. Since all measures had indicators of skewness and kurtosis ranging from -1 to +1, parametric procedures were applied. The correlation between the variables was tested by the Pearson correlation coefficient. Gender, age and school differences in mental health, depression, anxiety and stress were analysed by the use of ANOVA. To test the separate contribution of sociodemographic and family variables to the explanation of individual differences in adolescents' mental health, several hierarchical regression analyses were applied.

3. Results

As expected, variables involving adolescent mental health are highly interrelated, as are the family relationship assessment variables (*Table 4*). Participants who reported a high satisfaction with family relationships also rated family communication as positive. Adolescent age is generally unrelated to either family relationship assessments or mental health assessments. Only a significant, albeit very low, negative correlation was found between adolescent age and depression. Furthermore, the age of the parents is related to the adolescents' assessments in such a way that the age of both parents is significantly negatively related to the adolescents' assessments of family satisfaction and family communication. It should be added that the age of mothers is significantly negatively associated with the assessment of adolescent mental health. These are low but significant correlation coefficients. The education level of the mothers is unrelated to any assessment of adolescents, while the fathers' educational level is significantly negatively related to the level of stress and depression of the adolescents. In other words, adolescents of fathers possessing lower educational status rate the level of stress and depression higher.

Table 4
Correlations among major study variables

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1.	*Age*										
2.	*Mother's age*	.190**									
3.	*Father's age*	.235**	.741**								
4.	*Mother's education*	-.105**	.064*	-.041							
5.	*Father's education*	-.065*	.114**	.046	.503**						
6.	*Family communication*	-.028	-.132**	-.097**	-.028	.009					
7.	*Satisfaction with family*	-.018	-.131**	-.098**	-.028	-.015	.814**				
8.	*Positive mental health*	.032	-.080**	-.036	.008	-.001	.420**	.389**			
9.	*Stress*	-.021	.009	-.002	-.033	-.060*	-.285**	-.304**	-.494**		
10.	*Anxiety*	-.050	.024	.007	-.020	-.052	-.281**	-.288**	-.429**	.789**	
11.	*Depression*	-.062*	.027	-.005	-.054	-.060*	-.348**	-.365**	-.597**	.795**	.765**

*p < .05; **p < .01.

To examine age and gender differences in mental health assessment and levels of stress, depression, and anxiety, two-way MANOVA was conducted with age and gender as independent variables, followed by univariate tests for each dependent variable. These analyses' results are shown in *Table 5*.

Table 5
Adolescent's Mental health, Depression, Anxiety and Stress (gender and age comparison)

Dependent variables	*Independent variables*	*Wilks*	*F*	*df*
Mental Health, Depression, Anxiety and Stress	Gender	.957	13.54**	4,1203
	Age	.989	1.09	12,3183
	Gender x age	.984	1.58	12,3183

Univariate tests

Mental Health	Gender	27.89**	1,1206
	Age	.81	3,1206
	Gender x age	1.63	3,1206
Depression	Gender	21.30**	1,1206
	Age	2.01	3,1206
	Gender x age	1.71	3,1206
Anxiety	Gender	25.24**	1,1206
	Age	1.61	3,1206
	Gender x age	.47	3,1206
Stress	Gender	43.80**	1,1206
	Age	.47	3,1206
	Gender x age	1.95	3,1206

It can be concluded that, regardless of age, a systematically significant difference exists between adolescents in all indicators. Adolescent girls, compared to their male counterparts, rated their mental health lower and their levels of depression, anxiety, and stress significantly higher. This was found in all age groups, for all variables. Although differences concerning age are not significant, it should be noted that there is a noticeable trend of increasing mental health in older groups; i.e., it seems that the mental health of girls from the youngest age group: i.e., those attending year one of secondary school, is the most vulnerable. Since the results shown in *Table 5* do not suggest a conclusion about significant age differences for girls, one-way analyses were used to separately test differences between age groups for each criterion and showed that the difference was significant only for depression ($F = 3.45$, $df = 3,664$; $P = .016$). *Figure 1* shows these results. On the other hand, no such trend is observed in adolescent boys. Moreover, the results of depression and anxiety are very stable across age groups (*Figure 2*), and individual tests among age groups did not indicate any significant difference.

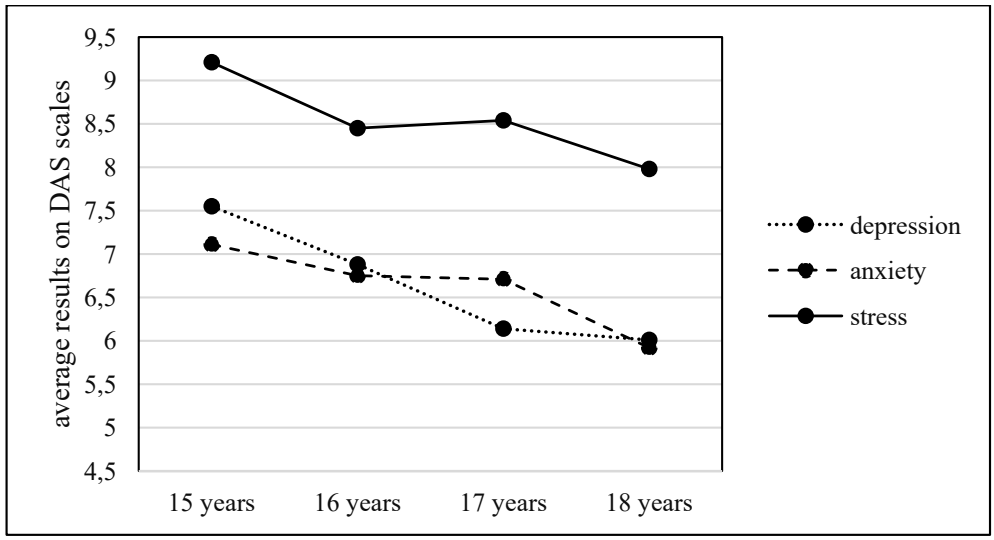

Figure 1
Depression, anxiety, and stress in adolescent girls of different age groups

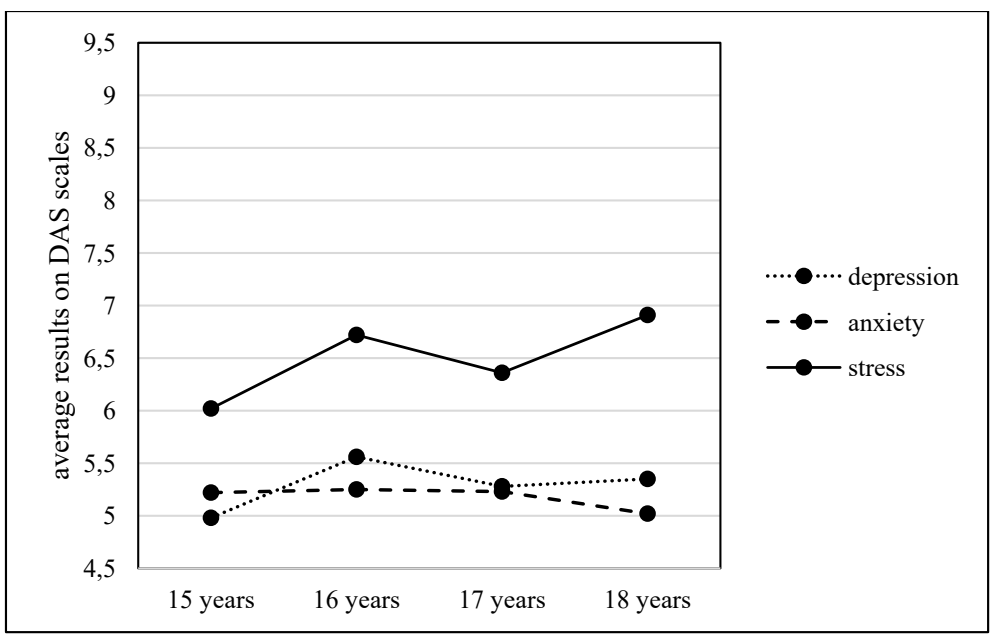

Figure 2
Depression, anxiety, and stress in adolescent boys of different age groups

Table 6 shows the results of MANOVA, followed by univariate tests with type of school as an independent variable. There were n = 91 participants in a subsample of 2- or 3-year vocational school; n = 610 participants in a subsample of 4- or 5-year vocational school, and n = 546 participants in a subsample of grammar high school.

Table 6
Adolescent's Mental health, Depression, Anxiety and Stress (school program comparison)

Dependent variables	*Independent variable*	*Wilks*	*F*	*df*
Mental, Health, Depression, Anxiety, and Stress	Type of school	.986	2.13*	8,2456
		Univariate tests		
Mental Health	Type of school		4.14*	2,1231
Depression	Type of school		2.63	2,1231
Anxiety	Type of school		1.74	2,1231
Stress	Type of school		1.32	2,1231

*p < .05; **p < .01.

The type of school proved to be important only in the assessment of mental health, with a subsequent analysis by groups showing that grammar high school students rated mental health lower than students in four-year vocational secondary schools. No significant differences in the type of school were found in other indicators of mental functioning (*Table 6*).

Figure 3 shows the proportion of participants who reported different sources of stress in the family. Slightly less than 5% of the participants experienced domestic violence, 8.47% of the participants experienced the divorce of their parents, about 20% of the participants experienced financial problems in the family and significant disagreements among parents, while, as expected, most participants reported conflicts with parents.

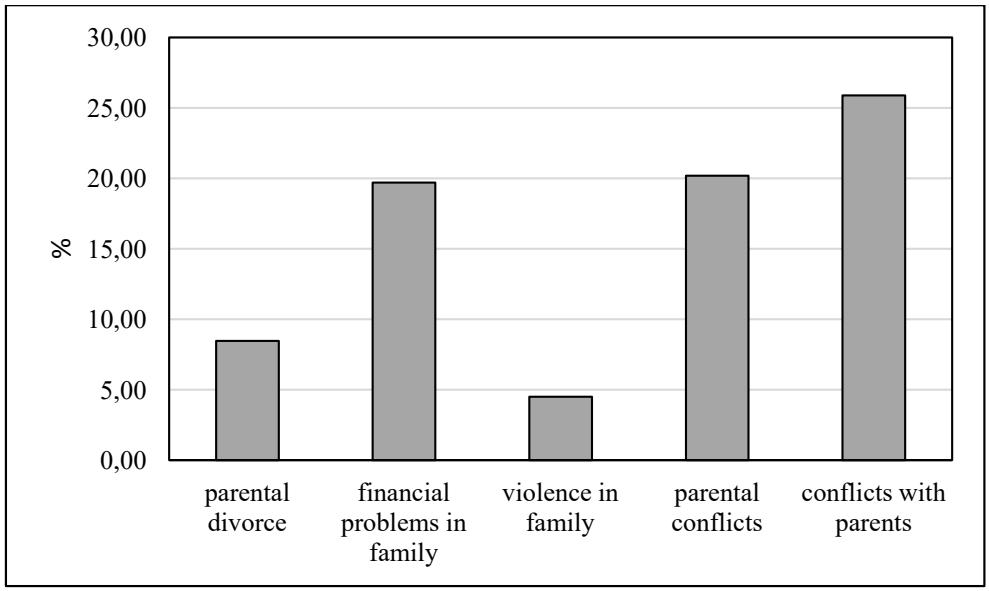

Figure 3
Proportion of participants who experienced the stated stressors within the family

Table 7 shows the results of hierarchical regression analyses with adolescent well-being variables as criteria and family characteristics as predictors. Given the previously identified significant differences in the gender of the participants, variables of participants' gender and age were introduced in the first step to control their eventual contribution when determining the contribution of family characteristics. In all analyses, the family's sociodemographic characteristics were introduced in the second step, sources of stress in the family in the third step, and assessments of family satisfaction and family communication in the last step of the analysis.

Selected predictors explained a total of 21% of mental health variance, 18% of depression, 14% of anxiety, and 15% of stress. For all four criteria, in addition to controlling the sociodemographic characteristics of adolescents and families as well as sources of stress within the family, family satisfaction introduced in the final steps of the analysis proved to be a significant predictor of adolescent mental health. The same was found for communication in the family except for the stress criterion.

Significant predictors of mental health are the gender and age of adolescents, family satisfaction, and communication within the family. Adolescent boys compared to adolescent girls, older people compared to younger people, and those who assessed higher family satisfaction and better communication, also assessed their mental health as better. Similar results were obtained in the analysis with depression as a

criterion, in addition to financial problems in the family as an additional significant predictor. For anxiety, in addition to age, gender, satisfaction and communication in the family, significant predictors prove to be also the experience of domestic violence and the experience of financial issues in the family. Furthermore, the results indicate more anxiety in adolescent girls than in adolescent boys, in the younger people as opposed to the older ones, and also more anxiety in those less satisfied with the family and the communication within it, as well as in those who have experienced financial issues in the family and domestic violence. Finally, gender, financial issues in the family, and family satisfaction proved to be significant predictors of stress, with adolescent girls as well as those less satisfied with their family experiencing higher stress.

Table 7
Hierarchical Regression Analysis with Mental Health variables as criteria

	Criteria			
	Mental Health	*Depression*	*Anxiety*	*Stress*
1. step				
Gender	-.16**	.16**	.18**	.21**
Age	.05	-.07*	-.06*	-.03
Type of school	-.03	-.04	-.05	-.03
R (R^2)	.17 (.03)	.17 (.03)	.19 (.03)	.21 (.04)
F (df)	11.27** (3,1140)	11.25** (3,1139)	13.59** (3,1139)	17.70** (3,1139)
2. step				
Gender	-.16**	.16**	.18**	.21**
Age	.06	-.08*	-.07*	-.04
Type of school	-.03	-.02	-.05	-.01
Mother's Age	-.12**	.09**	.06	.04
Father's Age	.05	-.06	-.02	-.02
Mother's Education	.02	-.04	.02	.00
Father's Education	.01	-.05	-.06	-.06
R (R^2)	.19 (.04)	.19 (.04)	.20 (.04)	.22 (.05)

	ΔR^2	.01*	.01	.01	.01
	F (df)	6.33** (7,1136)	6.16** (7,1135)	6.58** (7,1135)	8.27** (7,1135)
3. step				
Gender		-.14**	.13**	.16**	.18**
Age		.06*	-.09**	-.07*	-.05
Type of school		-.03	-.02	-.05	-.01
Mother's Age		-.10*	.06	.03	.01
Father's Age		.04	-.05	-.02	-.02
Mother's Education		.02	-.03	.02	.01
Father's Education		-.01	-.03	-.04	-.05
Divorce		.01	-.04	-.04	-.02
Financial problems		-.07*	.10**	.11**	.10**
Family violence		-.05	.07*	.12**	.05
Parental conflicts		-.03	.12**	.07	.11**
Conflicts with parents		-.08*	.06	.05	.08*
	R (R^2)	.25 (.06)	.31 (.10)	.31 (.10)	.33 (.10)
	ΔR^2	.02*	.06**	.06**	.05**
	F (df)	6.30** (12,1131)	10.30** (12,1130)	9.97** (12,1130)	11.10** (12,1130)
4. step				
Gender		-.13**	.11**	.15**	.18**
Age		.06*	-.08**	-.06*	-.04
Type of school		-.04	-.02	-.05	-.01
Mother's Age		-.06	.03	.04	-.02
Father's Age		.03	-.06	-.02	-.02
Mother's Education		.03	-.04	.01	.00
Father's Education		-.01	-.03	-.04	-.05
Divorce		.03	-.05	-.04	-.03

Financial problems	-.03	.07*	.09**	.08**
Family violence	-.01	.04	.09**	.02
Parental conflicts	.06	.06	.02	.06
Conflicts with parents	-.02	.01	.02	.04
Family communication	.32**	-.13**	-.11*	-.08
Satisfaction with family	.13**	-.21**	-.14**	-.17**
R (R^2)	.46 (.21)	.43 (.18)	.38 (.14)	.40 (.15)
ΔR^2	.15**	.08*	.04*	.05**
F (df)	21.66** (14,1129)	18.20** (14,1128)	13.31** (14,1128)	14.74** (14,1128)

4. Discussion

The goal of this research was to determine how different family characteristics, whether functional or structural, affect the mental health experience of adolescents. In addition to positive mental health, the same characteristics were examined concerning mental health problems – primarily internalized – since the substantive body of research indicates 20% of adolescents manifesting mental health issues, with anxiety and depression being the most prevalent ones (WHO 2014a; WHO 2014b; UNICEF 2017).

The family environment belongs to 'microecology', the closest and narrowest system that carries many risk and protective factors for mental health. Healthy family functioning depends on a number of factors, and one of the most significant is family communication, which directly affects the overall family atmosphere and the satisfaction experience of individuals in that family (Haskard et al. 2009; Peterson & Green 2009). Concerning the first research question on the connection between the sociodemographic characteristics of adolescents and their families on the one hand, and family communication, family satisfaction, and adolescent mental health on the other, the results showed that adolescents (regardless of their age) who assess positive family communication show high satisfaction with family relationships and positive mental health. This finding is consistent with a number of studies that speak in favour of the importance of good quality family communication and its connection to good quality family relationships and mental health (Alm et al. 2020; Berg et al. 2017; Reed et al. 2015; Morgan et al. 2012; Lutahr & Zelazo 2003; Masten 2001, as cited in Velez et al. 2019). Adolescent age is generally unrelated to either family relationship assessments or mental health. There is only a significant but low negative

correlation between adolescent age and depression. The result is not uncommon: some studies confirm that early adolescents at the beginning of secondary school exhibit a higher level of depression (combined with anxiety) compared to the older ones who attend upper grades of secondary school (Rice et al. 2011; Akos & Galassi 2004; Reić Ercegovac & Kalebić 2016), which can be associated with new situations, environments, requirements and expectations that they try to respond to. Concerning parental age, the results of our research show that the age of both parents stands as significantly negatively associated with assessments of family communication and family satisfaction, and also, the mother's age negatively correlated with the child's mental health. The negative relationship between parental age and adolescent family satisfaction and communication can be interpreted in the context of family cognitions and age-dependent behaviour. It is possible that older parents are more inclined to apply more traditional parental behaviours that promote higher control level and obedience versus supporting autonomy, which may reflect on children's assessments of the family environment, especially in adolescents seeking autonomy, avoiding strict family rules, and breaking boundaries that formed the framework of their expected behaviour during childhood. This is supported by research findings suggesting that redirecting people to more conservative values is a function of age (Robinson 2013), which is reflected in parental cognitions and behaviours, and given the wide age range of parents in this research (up to 70 years), it is possible that this also contributed to such results. However, since this research did not cover parental behaviours concerning the age of the parents and their parental cognition, these assumptions should be verified in subsequent studies.

Although a lower educational status of the parents is usually associated with lower mental health in some studies (APA 2020; Nguyen et al. 2017), the results of our research did not confirm this, except in the part where higher levels of stress and depression are expressed by adolescents whose fathers have a lower level of education. It is possible that the fathers' lower level of education is associated with lower family incomes, which can cause negative reactions from adolescents who express ever-growing needs in financial terms, and if the latter cannot be met, this can be an additional source of difficulty for adolescents. This is supported by the results of regression analyses which showed that financial problems in the family are a significant predictor of both adolescents' mental health and difficulties in their mental functioning of. Also, the results of previous research show that a lower socioeconomic status is associated with lower levels of education, and consequently, a higher level of stress and mental health issues (Alm et al. 2020; Berg et al. 2017).

Another research question sought to examine whether adolescents differ in their assessment of mental health, depression, anxiety, and stress concerning age, gender, and the schools they attend. Research around the world has shown mixed results when it comes to gender and mental health during childhood and adolescence, depending on the mental health indicators researched. In general, a large body

of research consistently points to gender differences when it comes to adolescent mental health, to the detriment of girls (Tejerina-Arreal et al. 2020; Berg et al. 2017; UNICEF 2017; WHO 2014b). In a large study conducted by UNICEF in 31 European countries, twice as many girls reported symptoms related to their mental health as boys at ages 13 and 15 (UNICEF 2017). On the other hand, young men are more likely to manifest externalized behavioural problems, addictive behaviours, and involvement in juvenile delinquency (Buist et al. 2020; Cummings & Davies 1994; Dornfeld & Kruttschnitt 1992, as cited in Berg et al. 2017; Maglica 2017; Ricijaš et al. 2016), and girls generally more often manifest internalized problems such as depression, anxiety, and higher levels of stress (Merikangas et al. 2011; WHO 2018). The results of our research clearly indicate that girls in all age groups assess their mental health lower, and the level of depression, anxiety, and stress higher. Although the differences concerning age did not prove to be significant, girls show a noticeable trend of increasing mental health in higher grades; i.e., it seems that the girls belonging to the youngest age group, the ones attending year one, have the most vulnerable mental health. Research on our samples also led to the conclusion that girls during the transition from primary to secondary school are the most vulnerable group in terms of mental health (Reić Ercegovac & Kalebić 2016). The results obtained are not surprising given that entering a new environment, being among new peers, exposed to new demands and expectations can be stressful and increase anxiety (Rice et al. 2011; Akos & Galassi 2004). It should be noted that girls are particularly vulnerable in this developmental transition for a number of reasons. Namely, compared to boys, girls are more focused on social relationships and acceptance by peers due to gender-typical socialization, which makes them more susceptible to stress and anxiety during the adjustment to the new environment, and should they not meet their expectations, it can increase dissatisfaction and depression. Furthermore, due to consistent gender differences in self-esteem to the detriment of girls (Quatman & Watson 2001; Bleidorn et al. 2016; Moksnes & Espnes 2013), adapting to a new environment and facing new demands may have a more negative effect on the already fragile self-esteem of girls during that period. On the other hand, better self-perception of young men can also serve as a protective factor in the stressful period of adjustment. Finally, since girls are continuously more focused on school obligations and achievements and are more committed to fulfilling school obligations (Roviš & Bezinović 2011), they may be more uncertain about academic achievements due to fulfilling their own and the environment's expectations, which can be reflected in stress and heightened anxiety. When it comes to the type of school, the difference was shown only in mental health, with better results achieved by students of four-year vocational secondary schools than students of high schools with a four-year generalist programmes. It is very possible to connect the obtained results to the complexity of high school curricula with generalist programmes, including the adolescents' curricular and

extracurricular obligations, as well as with the 'prestigiousness', and thus, higher standards of these schools compared to vocational schools.

Concerning stressors within the family environment, a smaller percentage of participants reported having experienced violence (5%) and parental divorce (8.47%), while a much higher number of respondents reported financial problems in the family (20%) and conflicts with parents (over 25%). Worth repeating is that general stress, problems related to parental stress, and the resulting dysfunction of family relationships play an important role in children's mental health and are often explored in this context (Berg et al. 2017; Manning & Lamb 2003; Duchovich et al. 2009; Merikangas et al. 2011). Socioeconomic status is most often viewed as a family variable and is considered an important protective and risk factor for health in general, and thus for mental health. It has a significant impact on the child's physical, social, and cognitive development (Nguyen et al. 2017; Ordóñez & Collins 2015; Lund et al. 2011). Low socioeconomic status (SES), indicated by lower household income, educational status, and poverty, is associated with a greater risk of developing a mental and behavioural disorder than in children and adolescents of middle or high SES (Reiss 2013). On the other hand, family conflicts, poor family relationships, and poor communication are strong risk factors for adolescent mental health, development of mental problems, addictions and even juvenile delinquency (Buist et al. 2020; Alm et al. 2020; Berg et al. 2017; Maglica 2017). This is confirmed by the results of our research, since the results of regression analyses showed that with control of sociodemographic family characteristics, financial problems, and conflicts within the family significantly predict the mental health of adolescents. Interestingly, on top of these factors, satisfaction with family relationships and intra-family communication also explain a significant portion of mental health variance.

In other words, regardless of the sociodemographic characteristics of the family and the sources of stress in the familial context, communication among family members and family satisfaction further contribute to all indicators of adolescent mental health. This undoubtedly implies the importance of the family atmosphere and the adolescent's perception of the family as a strong protective factor for mental health in adolescence. It should be noted that all predictors included in the research explain between 14 and 21% of the variance in adolescent mental health which means that there are a number of other important factors to consider when explaining adolescent mental health. Nevertheless, the results of regression analyses showed that among the included predictor variables, the age and gender of adolescents, financial stressors in the family, satisfaction and family communication were the most significant contributors. Namely, these variables in the last steps of the analysis proved to be significant predictors of all criteria variables of mental health. Bearing in mind the importance of mental health for the success of the adolescents' developmental tasks, the results confirm the importance of a stable, safe, and supportive family atmosphere for the adolescent well-being.

5. Limitations and Conclusion

Before concluding, it is necessary to look at the limitations of the conducted research. The first stems from the fact that only adolescents participated in it, so for future research it would be useful to include parents and their assessments of the family environment, which would provide additional important information about the relationship between family characteristics and mental health in adolescence. Furthermore, in the research, there was a significantly lower share of two-year and three-year high school students compared to four-year school and high school students, but given the share in the high school population, students with the lowest level of high school education are proportionally represented. Finally, with regard to mental health as the main dependent variable in the research, it should be noted that specific diagnosed mental health difficulties were not controlled; i.e., adolescents were treated as a homogeneous sample in the research. Also, although relatively large, the sample is from only one urban environment, something which should be considered when interpreting the results. Despite the limitations, the research confirmed the already known results about gender differences in mental health and internalized mental health problems in adolescence, highlighted the importance of environmental stressors affecting the family for adolescent mental health, and confirmed the added importance of family relationships and communication as a protective factor in the mental health of adolescents.

References

Ahmadi, K., S.M. Nabipoor Ashrafi, S.A. Kimiaee & M.H. Afzali (2010) 'Effect of Family Problem-Solving on Marital Satisfaction', *Journal of Applied Sciences* 10(8), 682–87 (https://doi.org/10.3923/jas.2010.682.687).

Akhlaq, A., N. Iqbal Malik & N. Aslam Khan (2013) 'Family Communication and Family System as the Predictors of Family Satisfaction in Adolescents', *Science Journal of Psychology* 2013, Article ID: sjpsych-258 (https://www.sjpub.org/sjpsych/sjpsych-258.pdf).

Akos, P. & J.P. Galassi (2004) 'Middle and High School Transitions as Viewed by Students, Parents, and Teachers', *Professional School Counselling* 7, 212–21.

Alm, S., S.B. Låftman, F. Sivertsson & H. Bohman (2020) 'Poor Family Relationships in Adolescence as a Risk Factor of In-Patient Psychiatric Care Across the Life Course: A Prospective Cohort Study', *Scandinavian Journal of Public Health* 48(7), 726–32 (https://doi.org/10.1177/1403494820902914).

American Psychological Association (2020) *Child and Adolescent Mental and Behavioral Health Resolution*, retrieved 1 Jul 2021 from https://www.apa.org/about/policy/child-adolescent-mental-behavioral-health.

Ballester, L., M. Valero, C. Orte & J. Amer (2020) 'An Analysis of Family Dynamics: A Selective Substance Abuse Prevention Programme for Adolescents', *European Journal of Social Work* 23(1), 93–105 (https://doi.org/10.1080/1369 1457.2018.1473842).

Berg, N., O. Kiviruusu, S. Karvonen, O. Rahkonen & T. Huurre (2017) 'Pathways from Problems in Adolescent Family Relationships to Midlife Mental Health via Early Adulthood Disadvantages – A 26-Year Longitudinal Study', *PloS ONE* 12(5), e0178136 (https://doi.org/10.1371/journal.pone.0178136).

Bleidorn, W., R.C. Arslan, J.J.A. Denissen, P.J. Rentfrow, J.E. Gebauer, J. Potter & S.D. Gosling (2016) 'Age and Gender Differences in Self-Esteem – A Cross-Cultural Window', *Journal of Personality and Social Psychology* 111(3), 396–410 (https://doi.org/10.1037/pspp0000078).

Bronfenbrenner, U. (1979) *The Ecology of Human Development* (Cambridge: Harvard UP).

Buist, K.L., V.I. Eichelsheim, W.L. Cook, P.A.C. van Lier, H.M. Koot & W.H.J. Meeus (2020) 'Family Negativity and Delinquent Behavior in Adolescence: A Predictive Multivariate Latent Growth Analysis', *Psychology, Crime & Law* 26(9), 849–67 (https://doi.org/10.1080/1068316X.2020.1742337).

Campion, J. (2019) *Public Mental Health – Evidence, Practice and Commissioning. Royal Society for Public Health*, retrieved 1 Jul 2021 from: https://www.researchgate.net/publication/339927657_Campion_2019_Public_mental_health_-_evidence_practice_and_commissioning_Royal_Society_of_Public_Health.

Campion, J., A. Javed, M. Vaishnav & M. Marmot (2020) 'Public Mental Health and Associated Opportunities', *Indian Journal of Psychiatry* 62(1), 3–6, retrieved 1 Jul 2021 from https://www.indianjpsychiatry.org/text.asp?2020/62/1/3/274833.

Clarke, A., T. Friede, R. Putz, J. Ashdown, S. Martin, A. Blake, Y. Adi, J. Parkinson, P. Flynn, S. Platt & S. Stewart-Brown (2011) 'Warwick-Edinburgh Mental Well-being Scale (WEMWBS): Validated for Teenage School Students in England and Scotland. A Mixed Method Assessment', *BMC Public Health* 11, 487 (https://doi.org/10.1186/1471-2458-11-487).

Čotar Konrad, S. (2016) 'Family Emotional Expressiveness and Family Structure', *Psihologija* 49(4), 319–33 (https://doi.org/10.2298/PSI1604319C).

Dahl, R.E., N.B. Allen, L. Wilbrecht & A.B. Suleiman (2018) 'Importance of Investing in Adolescence from a Developmental Science Perspective', *Nature* 554(7693), 441–52 (https://doi.org/10.1038/nature25770).

Duchovich, C.A., J.E. Gerkensmeyer & J. Wu (2009) 'Factors Associated with Parental Distress', *Journal of Child and Adolescent Psychiatric Nursing* 22(1), 40–48 (https://doi.org/10.1111/j.1744-6171.2008.00168.x).

Epstein, N.B., D. Bishop, C. Ryan, I.W. Miller & G. Keitner (1993) 'The McMaster Model View of Healthy Family Functioning' in F. Walsh, ed., *Normal Family Processes* (New York/London: The Guilford) 138–60.

Erskine, H.E., A.J. Baxter, G. Patton, T.E. Moffitt, V. Patel, H.A. Whiteford & J.G. Scott (2017) 'The Global Coverage of Prevalence Data for Mental Health Disorders in Children and Adolescents', *Epidemiology and Psychiatric Sciences* 26(4), 395–402 (https://doi.org/10.1017/S2045796015001158).

Hafen, M. Jr. & D.R. Crane (2003) 'When Marital Interaction and Intervention Researchers Arrive at Different Points of View: The Active Listening Controversy', *Journal of Family Therapy* 25(1), 4–14.

Haskard, K.B., M.R. Dimatteo & J. Heritage (2009) 'Affective and Instrumental Communication in Primary Care Interactions: Predicting the Satisfaction of Nursing Staff and Patients', *Health Communication* 24(1), 21–32 (https://doi.org/10.1080/10410230802606968).

Jones, P.B. (2013) 'Adult Mental Health Disorders and Their Age at Onset', *The British Journal of Psychiatry* 202 (S54), 5–10 (https://doi.org/10.1192/bjp.bp.112.119164).

Landstedt, E., A. Hammarström & H. Winefield (2015) 'How Well Do Parental and Peer Relationships in Adolescence Predict Health in Adulthood?', *Scandinavian Journal of Public Health* 43(5), 460–68 (https://doi.org/10.1177/1403494815576360).

Li, Y. & L.A. Warner (2015) 'Parent–Adolescent Conflict, Family Cohesion, and Self-Esteem among Hispanic Adolescents in Immigrant Families: A Comparative Analysis', *Family Relations* 64 (5), 579–91 (https://doi.org/10.1111/fare.12158).

Liu, S., Z. Volčić & C. Gallois (2015) *Introducing Intercultural Communication: Global Cultures and Contexts* (London: SAGE).

Lovibond, S.H. & P.F. Lovibond (1995) *Manual for the Depression Anxiety Stress Scales* (2nd ed.; Sydney: Psychology Foundation).

Lund, C., M. De Silva, S. Plagerson, S. Cooper, D. Chisholm, J. Das, M. Knapp & V. Patel (2011) 'Poverty and Mental Disorders: Breaking the Cycle in Low-Income and Middle-Income Countries', *Lancet* 378(9801), 1502–14 (https://doi.org/10.1016/S0140-6736(11)60754-X).

Maglica, T. (2017) Obilježja roditeljstva I odnos roditelja prema kockanju kao prediktori kockanja muške djece [Characteristics of Parenthood and Parental Relationships Towards Gambling as Predictors of Their Male Children] (PhD diss., University of Zagreb, Croatia).

Manning, W.D. & K.A. Lamb (2003) 'Adolescent Well-Being in Cohabiting, Married, and Single Parent Families', *Journal of Marriage and Family* 65(4), 876–93 (https://doi.org/10.1111/j.1741-3737.2003.00876.x).

Maurović, I., L. Liebenberg & M. Ferić (2020) 'A Review of Family Resilience: Understanding the Concept and Operationalization Challenges to Inform Research and Practice', *Child Care in Practice* 26(4), 337–57 (https://doi.org/10.1080/13575279.2020.1792838).

Mcnaughton, D. & B.R. Vostal (2010) 'Using Active Listening to Improve Collaboration with Parents: The LAFF Don't Cry Strategy', *Intervention in School and Clinic* 45(4), 251–56 (https://doi.org/10.1177/1053451209353443).

Merikangas, K.R., J.P. He, M. Burstein, J. Swendsen, S. Avenevoli, B. Case, K. Georgiades, L. Heaton, S. Swanson & M. Olfson (2011) 'Service Utilization for Lifetime Mental Disorders in US Adolescents: Results of the National Comorbidity Survey–Adolescent Supplement (NCS-A)', J*ournal of American Academy of Child & Adolescent Psychiatry* 50(1), 32–45 (https://doi.org/10.1016/j.jaac.2010.10.006).

Moksnes, U.K. & G.A. Espnes (2013) 'Self-Esteem and Life Satisfaction in Adolescents–Gender and Age as Potential Moderators', *Quality Life Research* 22(10), 2921–28 (https://doi.org/10.1007/s11136-013-0427-4).

Morgan, Z., T. Brugha, T. Fryers & S. Stewart-Brown (2012) 'The Effects of Parent-Child Relationships on Later Life Mental Health Status in Two National Birth Cohorts', *Social Psychiatry and Psychiatric Epidemiology* 47, 1707–15 (https://doi.org/10.1007/s00127-012-0481-1).

Morris, A.S., J.S. Silk, M.D.S. Morris, L. Steinberg, K.J. Aucoin & A.W. Keyes (2011) 'The Influence of Mother-Child Emotion Regulation Strategies on Children's Expression of Anger and Sadness', *Developmental Psychology* 47(1), 213–25 (https://doi.org/10.1037/a0021021).

Nguyen, J., M. Sberna Hinojosa, S. Strickhouser Vega, R. Newman, E. Strohacker & B. Noyongoyo (2017) 'Family Predictors of Child Mental Health', *Journal of Family Issues* 39(4), 935–59 (https://doi.org/10.1177/0192513X16684891).

Novak, M., N.J. Parr, M. Ferić, J. Mihić & V. Kranželić (2021) 'Positive Youth Development in Croatia: School and Family Factors Associated with Mental Health of Croatian Adolescents', *Frontiers in Psychology* 11:611169 (https://doi.org/10.3389/fpsyg.2020.611169).

Olson, D.H., D.M. Gorall & J.W. Tiesel (2006) *Faces IV package* (Minneapolis, MN: Life Innovations).

Ordóñez, A.E. & P.Y. collins (2015) 'Advancing Research to Action in Global Mental Health', *Child and Adolescent Psychiatric Clinics of North America* 24(4), 679–97 (https://doi.org/10.1016/j.chc.2015.06.002).

Patton, G.C., S.M. Sawyer, J.S. Santelli, D.A. Ross, R. Afifi, N.B. Allen, M. Arora, P. Azzopardi, W. Baldwin, C. Bonell, R. Kakuma, E. Kennedy, J. Mahon, T. Mcgovern, A.H. Mokdad, R. Patel, S. Petroni, N. Reavley, K. Taiwo, J. Waldfogel, D. Wickremarathne, C. Barroso, Z. Bhutta, A.O. Fatusi, A. Mattoo, J. Diers, J. Fang, J. Ferguson, F. Ssewamala & R.M. Viner (2016) 'Our Future: A Lancet Commission on Adolescent Health and Wellbeing', *The Lancet Commissions* 387 (10036), 2423–78 (https://doi.org/10.1016/S0140-6736(16)00579-1).

Peterson, R. & S. Green (2009) 'Families First – Keys to Successful Family Functioning. Communication'*, Virginia Cooperative Extension* 350–092, retrieved 3 Jul

2021 from https://vtechworks.lib.vt.edu/bitstream/handle/10919/48300/350-092_pdf.pdf?sequence=1&isAllowed=y.

Polanczyk, G.V., G.A. Salum, L.S. Sugaya, A. Caye & L.A. Rohde (2015) 'Annual Research Review: A Meta-Analysis of the Worldwide Prevalence of Mental Disorders in Children and Adolescents', *Journal of Child Psychology and Psychiatry* 56(3), 345–65 (https://doi.org/10.1111/jcpp.12381).

Quatman, T. & C.M. Watson (2001) 'Gender Differences in Adolescent Self-Esteem: An Exploration of Domains', *The Journal of Genetic Psychology* 162(1), 93–117 (https://doi.org/10.1080/00221320109597883).

Reed, K., A.J. Ferraro, M. Lucier-Greer, C. Barber (2015) 'Adverse Family Influences on Emerging Adult Depressive Symptoms: A Stress Process Approach to Identifying Intervention Points', *Journal of Child and Family Studies* 24, 2710–20 (https://doi.org/10.1007/s10826-014-0073-7).

Reić Ercegovac, I. & Z. Penezić (2012) 'Skala depresivosti, anksioznosti i stresa' [Depression, Anxiety and Stress Scale] in A. Proroković, V. Ćubela Adorić, Z. Penezić & I. Tucak Junaković, eds., *Zbirka psihologijskih skala i upitnika, svezak 6*. (Sveučilište u Zadru, Odjel za psihologiju) 15–22.

Reić Ercegovac, I. & K. Kalebić (2016) 'Dobne i spolne razlike u depresivnosti kod djece i adolescenta na području grada Splita' [Age and Gender Differences in Depression in children and adolescents from City of Split], *Peadiatria Croatica* 60(4), 133–40.

Reiss, F. (2013) 'Socioeconomic Inequalities and Mental Health Problems in Children and Adolescents: A Systematic Review', *Social Science & Medicine* 90, 24–31 (https://doi.org/10.1016/j.socscimed.2013.04.026).

Rice, F., N. Frederickson & J. Seymour (2011) 'Assessing Pupil Concerns About Transition to Secondary School', *British Journal of Educational Psychology* 81(2), 244–63 (https://doi.org/10.1348/000709910X519333).

Ricijaš, N., D. Dodig Hundrić, A. Huić & V. Kranželić (2016) 'Kockanje mladih u Hrvatskoj- učestalost igranja i zastupljenost problematičnog igranja' [Youth Gambling in Croatia – Frequency and Prevalence of Problematic Gambling], *Kriminologija i socijalna integracija* 24(2), 24–47.

Robinson, O. C. (2013) 'Values and Adult Age: Findings from Two Cohorts of the European Social Survey', *European Journal of Ageing* 10(1), 11–23 (https://doi.org/10.1007/s10433-012-0247-3).

Roviš, D. & P. Bezinović (2011) 'Vezanost za školu- analiza privrženosti i predanosti školskim obvezama kod srednjoškolaca' [School Bonding- An Analysis of Attachment to School and Commitment to Schooling in High School Students]', *Sociologija i prostor: časopis za istraživanje prostornoga i sociokulturnog razvoja* [Journal for Spatial and Socio-culturaal Development Studies] 49(2), 185–208 (https://doi.org/10.5673/sip.49.2.4).

Schnyder, N., D. Lawrence, R. Panczak, M.G. Sawyer, H.A. Whiteford, P.M.

Burgess & M.G. Harris (2019) 'Perceived Need and Barriers to Adolescent Mental Health Care: Agreement Between Adolescents and Their Parents', *Epidemiology and Psychiatric Sciences* 29, e60 (https://doi.org/10.1017/S2045796019000568).

Sheehan, P., K. Sweeny, B. Rasmussen, A. Wils, H.S. Friedman, J. Mahon, G.C. Patton, S.M. Sawyer, E. Howard, J. Symons, K. Stenberg, S. Chalasani, N. Maharaj, N. Reavley, H. Shi, M. Fridman, A. Welsh, E. Nsofor & L. Laski (2017) 'Building the Foundations for Sustainable Development: A Case for Global Investment in the Capabilities of Adolescents', *The Lancet Health Policy* 30(10104), 1792-1806 (https://doi.org/10.1016/S0140-6736(17)30872-3).

Sloboda, Z. & H. Petras, eds. (2014) *Defining Prevention Science* (Rockville, USA: JBS International) retrieved 3 Jul 2021 from https://link.springer.com/content/pdf/10.1007/978-1-4899-7424-2.pdf.

Tejerina-Arreal, M., C. Parker, A. Paget, W. Henley, S. Logan, A. Emond & T. Ford (2020) 'Child and Adolescent Mental Health Trajectories in Relation to Exclusion from School form the Avon Longitudinal Study Parents and Children', *Child and Adolescent Mental Health* 25(4), 217–23 (https://doi.org/10.1111/camh.12367).

UNICEF (2017) *Adolescents' Mental Health: Out of the Shadows* (Florence: UNICEF Office of Research-Innocenti) retrieved 4 Jul 2020 from https://www.unicef-irc.org/publications/pdf/IRB_2017_12.pdf.

Van Loon, L.M.A., M.O.M. Van De Ven, K.T.M. Van Doesum, C.L.M. Witteman & C.M.H. Hosman (2014) 'The Relation Between Parental Mental Illness and Adolescent Mental Health: The Role of Family Factors', *Journal of Child and Family Studies* 23, 1201–14 (https://doi.org/10.1007/s10826-013-9781-7).

Vélez, C.E., S.L. Braver, J.T. Cookston, W.V. Fabricius & R.D. Parke (2019) 'Does Mattering to Parents Matter to Adolescent Mental Health? A Psychometric Analysis', *Family Relations – Interdisciplinary Journal of Applied Family Science* 69(1), 180–94 (https://doi.org/10.1111/fare.12396).

Weger, H. Jr., G. Castle Bell, E.M. Minei & M.C. Robinson (2014) 'The Relative Effectiveness of Active Listening in Initial Interactions', *International Journal of Listening* 28(1), 13–31 (https://doi.org/10.1080/10904018.2013.813234).

World Health Organization (2014a) *Health for the World's Adolescents: A Second Chance in the Second Decade: Summary* (Geneva: WHO) retrieved 3 Jul 2021 from https://apps.who.int/iris/bitstream/handle/10665/112750/WHO_FWC_MCA_14.05_eng.pdf?sequence=1&isAllowed=y.

World Health Organization (2014b) *Preventing suicide: a global perspective* (Geneva: WHO) retrieved 3 Jul 2020 from https://apps.who.int/iris/bitstream/handle/10665/131056/9789241564779_eng.pdf.

World Health Organization (2018) *Gender Disparities in Mental Health,* retrieved 3 Jul 2021 from https://who.int/mental_health/media/en/242.pdf.

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https://doi.org/10.5708/EJMH.16.2021.2.2

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PERCEIVED PHYSICAL AND PSYCHOLOGICAL HEALTH IN MIDDLE ADULTHOOD

Links to Marital Satisfaction, Age of Marriage, and SES

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Background: The life course health development approach, as a new theoretical model relating to health, dwells on psychosocial factors as well as biological factors, and it proposes that the effects of developmental timing unfolding over one's lifespan should be considered. Based on this theoretical model, as well as empirical studies relating to marriage and health, one of the psychosocial factors that may contribute to the health of middle-aged individuals is the marital relationship.
Aims: The aim of this study – conducted with individuals in middle adulthood – is to investigate the relationships between marital satisfaction, age at the time of marriage, SES (socioeconomic status) and psychological and physical health.
Method: Data was collected from middle-aged individuals between 40–69 years in Turkey (160 women and 142 men). The World Health Organization Quality of Life Measurement Tool, Brief Symptom Inventory, Marriage Life Scale, and a Demographic Information Form were used to assess the participants' perceived physical and psychological health, their marital satisfaction, their age of marriage, and SES.
Results: A path analysis indicated that the age of marriage was positively related, and perceived psychological health problems were negatively related to perceived physical health. Both marital satisfaction and SES were negatively related to perceived psychological health problems. Upon examination of the mediator role of psychological health problems and SES, it was observed that both marital satisfaction and SES were related to perceived physical health through perceived psychological health problems. Also, the age of marriage was related to perceived psychological health problems via SES.
Conclusion: The findings showed that marriage is an important component in the evaluation of perceived health in middle age; individuals are healthier when they get married at a more mature age and have a positive marital relationship.

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1. Introduction

Numerous studies from many disciplines are published every year in order to understand and improve human health (Halfon et al. 2018). Nowadays, the 'life course health development approach', which focuses on the dynamic interactions of the individual with the environment over time, has moved to the forefront when evaluating health. The life course health development approach examines health with a procedure that evaluates psychological and social processes rather than reflecting only on the basis of biological processes (Borrell-Carrió et al. 2004; Halfon & Forrest 2018). In line with these theoretical models, current studies show that health is closely related to many social and psychological factors, such as interpersonal relations (Ahnquist et al. 2012), and social support (Uchino 2006), and stress (Schneiderman et al. 2005).

Within the scope of these psychological and social processes, one of the factors that may play a role in the health of middle-aged and old-aged individuals is the marital relationship (Choi et al. 2016; Slatcher & Selçuk 2017). In this study, the authors plan to investigate the relationships between physical and psychological health, marital satisfaction, and age of marriage in middle adulthood. The life course health development approach and some scientific models provide a theoretical base for our research model. The life course health development method addresses how health changes over time. According to this scheme, developmental timing is important and the effect of the timing of exposures unfolds over a lifespan (Halfon & Forrest 2018). In accordance with this theoretical framework, we assumed that individuals will be exposed to different effects over time, depending on their age at marriage. Individuals who get married at an early age are in a more disadvantageous position than those who get married later in life. People who marry at an early age are more likely to struggle with several economic problems and stress in later years because they have fulfilled adult roles before they sufficiently achieved their identities and careers (Bell & Lee 2006; Falci et al. 2010). Also, psychological immaturity poses a risk to their marital relationships. These factors may negatively affect their marriages (Lehrer 2008). Also, some researchers proposed a variety of theoretical models that psychological processes may mediate the relationship between marital quality and physical health. Marital relationships support or deteriorate psychological health, which in turn affects physical health. Positive marital characteristics including social support, intimacy, and negative marital characteristics such as dissatisfaction and conflict, affect the psychological processes, which in turn influence biological mechanisms such as blood pressure and the immune system, and then various

health outcomes emerge depending on these effects (Robles 2014; Robles et al. 2014; Slatcher 2010).

Based on this theoretical model and empirical studies relating to marriage and health, our aim is to examine the links between age at the time of marriage, marital satisfaction, and psychological and physical health, with this cross-sectional study at a relational level. This study proposed that the age of marriage and marital satisfaction are linked to psychological health, which in turn is related to physical health. We hope that our descriptive findings may offer some perspectives for conceptual models of future longitudinal studies.

2. Marital satisfaction

Marriage is seen as the most important form of relationship in life by many adults. Positive marital relationships have important effects on physical health (Bookwala 2015; Wilson et al. 2021) and well-being (Chopik 2017). Studies have shown that married individuals experience more advantages than the unmarried in terms of psychological (Kendig et al. 2007; Waite et al. 2009) and physical health (Channon et al. 2016; Niedhammer et al. 2013; Wilson & Oswald 2005). It is deemed that some factors, such as spousal support and spouses' influence on each other's health, are the determinants in proving that married individuals are healthier than unmarried individuals (Hawkins & Booth 2005; Waite & Lehrer 2003). Being married reinforces the positive mood by providing social support to an individual, and this situation supports better health behaviors, which means taking better care of oneself (Slatcher 2010). Indeed, divorced or unmarried individuals were found to have a higher tendency in acquiring drinking and smoking habits than married people (Keenan et al. 2017).

However, being married does not provide advantages in all circumstances, and whether a marriage has positive characteristics should also be considered. Having an unhappy marriage is more associated with poor health than having a happy marriage (Lawrence et al. 2019). The positive and negative aspects of marriage can affect an individual's cognitive processes (stress-related cognitive assessments and attributions to partner behaviors), mood, and health. This situation affects the endocrine, cardiovascular, and immune systems, as well as gene expression, and determines either being healthy or having a disease (Slatcher 2010). For example, Holt-Lunstad and colleagues (2008) found that people having a good marriage have better blood pressures and lower depression, and single people have better blood pressures than people having a poor marriage. Similarly, women who did not have a harmonious marriage visited the doctors more frequently due to depression and physical health problems; depression did not increase among women who had divorced their spouses with whom they had a discordant marriage, their

physical health was reported to be in good condition (Prigerson et al. 1999). In this context, marriage does more harm than good, especially when it has negative and conflict-ridden characteristics. Numerous studies have shown that individuals with conflicting marital relationships and low marital satisfaction possess poor physical health (Bookwala 2005; Galinsky & Waite 2014; Gallo et al. 2003; Grames et al. 2008; Hawkins & Booth 2005; Lawrence et al. 2019; South & Krueger 2013) and they are more likely to even die early (Whisman et al. 2018). In a study conducted with adults that lasted for four years, it was found that an increase in marriage quality has a positive effect on physical health (Choi et al. 2016).

Marriage quality has consequences on psychological health as well as physical health. Individuals who have a stressful marriage (Sandberg et al. 2012), low marital satisfaction (Azizi et al. 2019), and who often have conflicts with their spouses, have a higher tendency to suffer from depression (Choi & Marks 2008). In addition, other psychological disorders have been observed to be at higher rates among individuals with low marital satisfaction (Abbas et al. 2019; Alipour et al. 2019; Whisman & Uebelacker 2003). Although studies have shown that a marital relationship is directly related to both physical and psychological health, it is also possible that psychological health plays a role in the association between physical health and marriage (Galinsky & Waite 2014; Grames et al. 2008). A study conducted with older adults found that depression has a mediatory role in the effect of marital quality on physical health. Accordingly, it was reported that higher marital quality is associated with better physical health in the case of lower depression; on the other hand, higher marital quality is slightly related to poor physical health in the case of higher depression (Chen & Austin 2019). Similarly, a study conducted with people with intestinal diseases found that those who had hostile interactions with their spouses had worse blood values and that having a history of mood disorder was associated with more negative blood values (Kiecolt-Glaser et al. 2018). During arguments with the spouse, many adverse health events occur, such as the acceleration of heart rate, changes in stress-related hormone levels, and irregularities in the immune system (Robles & Kiecolt-Glaser 2003). In fact, it was found that individuals involved in a more stressful marriage have a more weakened immune system after two years (Jaremka et al. 2013).

In conclusion, although the marriage relationship is associated with more positive health, the quality of the marital relationship also seems important. Social factors can negatively affect health by interacting with other factors or by accumulating their effects over time (Diez-Roux 2007). Since individuals spend more time in marriages during middle age than their younger counterparts (Bookwala 2005; Kiecolt-Glaser & Newton 2001) examining the characteristics of marriage in middle adulthood can reveal important findings in terms of their health.

3. Age of marriage

Another aspect of marital relationships that plays a role in individuals' health concerns the age they are married. Although the age of marriage in many countries has increased gradually compared to the previous years, significant variance still exists between individuals in terms of the age of their first marriage (Arnett 2006). A variety of personal, interpersonal, and aspirational factors can determine the timing of an adulthood role (Melnikas & Romero 2019). In Turkey, the mean age of women's first marriage is 25.1, and the mean age of men's first marriage is 27.9 (TSI 2021). Individuals usually prefer to get married between the ages of 20–29 in many countries (UNECE 2017). Men prefer older ages to get married than women (Eurostat 2020). Studies generally suggest that marriages under the age of 20 are often associated with riskier conditions, the risks reduce over 30 years of age (Amuedo-Dorantes & Kimmel 2005; Brand & Davis 2011; Sener & Terzioğlu 2008). According to the Turkish Statistical Institute's data, the rate of individuals under the age of 20 among people who got married for the first time in 2020 was 13.73%, 12.30% of these individuals were women, and 1.43% were men (TSI 2021).

Researches indicated that the timing of marriage affects both the quality of the marriage and the individual's well-being (Johnson et al. 2017; Pekel-Uludağli 2017; Shaud & Asad 2020). For instance, it was reported that people who marry early have lower marital satisfaction (Demir 2014; Hajihasani & Sim 2019; Pekel-Uludağli & Akbaş 2019a) and a less stable (Lehrer & Chen 2013), more discordant marriage compared with individuals who marry later in life (Arshad et al. 2014; Shaud & Asad 2020; Şener & Terzioğlu 2008), and also they are more likely to get divorced (Widyastari et al. 2020). Individuals who undertake early adulthood roles such as marriage and having children have lower economic conditions because they do not receive adequate education (Falci et al. 2010; Shpiegel & Cascardi 2018; Taylor 2009) and they are more likely to live in poverty in later years (Hamilton 2012). These marital problems experienced by people who get married at an early age are likely to stem from negative economic conditions. Pekel-Uludağli and Akbaş (2019b) revealed that there is no significant difference between individuals who marry early and late in terms of marital satisfaction when income and education were controlled. Also, as an expected consequence of these difficult experiences, more psychological (Carlson 2012; Fakhari et al. 2020; Pekel-Uludağli & Akbaş 2019b) and physical health problems are observed among people who marry at an early age (Dupre & Meadows 2007).

4. The present study

In line with the literature summarized above, this study aims to investigate the association between marital satisfaction, age of marriage, SES and perceived

psychological and physical health of individuals in middle adulthood. This study plans to examine middle-aged adults' perceived health in terms of age of marriage, marital satisfaction, and SES. In this context, marriage satisfaction, age of marriage, and SES are expected to be negatively associated with perceived psychological health problems of middle-aged adults, and they are expected to be positively associated with perceived physical health. The other aim of the study is to evaluate whether perceived psychological health plays a mediator role in the association between marital satisfaction, age of marriage, SES and perceived physical health. Marital satisfaction and age of marriage are expected to have a negative effect on perceived psychological health problems, which in turn would negatively impact the perceived physical health. In line with relevant literature (Falci et al. 2010; Shpiegel & Cascardi 2018), the age at the time of marriage is expected to predict positively SES, which in turn would predict negatively perceived psychological health problems.

5. Method

5.1. Participants

A total of 302 adults (160 females, 142 males) aged between 40–69 years (mean = 49.89, S = 6.48) participated in the study. We determined this age range in accordance with the age ranges for middle adulthood in relevant literature and textbooks (e.g., Augustus-Horvath & Tylka 2011; Santrock 2018; Steinberg et al. 2010; Sutton et al. 2010). All of the participants are married and 96.4% of them have children. The mean of their marital duration is 25.65 (S = 8.23). The education level of participants was classified as: 2.6% are literate; 15.2% are primary school, 17.2% are middle school, 25.8% are high school, 35.1% are university graduates, 4% possessing master's and PhD degrees. 58.6% of the participants are employed. Their monthly incomes: 2.9% was 1,000 TL (Turkish lira) and below, 26% was between 1,001-2,000 TL, 40.7% was between 2,001-4,000 TL, 19.8% was between 4,001 - 6,000 TL and 10.6% was 6,001 TL and above. 7.7% of the participants stated they had a psychological disorder and 25.4% reported having a physical illness.

5.2. Measures

The participants' perceived physical and psychological health, marital satisfaction, and the age of marriage were measured using the World Health Organization Quality of Life Measurement Tool, Brief Symptom Inventory, Marriage Life Scale and Demographic Information Form.

World Health Organization Quality of Life Measurement Tool (WHO-QOL-BREF). WHOQOL-BREF is a short form of the 'World Health Organization Quality of Life Scale' developed by the World Health Organization (1996). The scale, which consists of 26 items, has a five-point rating ('1 = Very bad to 5 = Very good'; '1 = Not pleased at all to 5 = Very Pleased'; '1 = Not at all to 5 = Infinitely'; '1 = Not at all to 5 = Totally') and high scores received from the scale indicate physical health status (e.g., 'How satisfied are you with your health?'). Adaptation of the scale to Turkish has been performed by Eser and colleagues (1999). It contains four subscales as physical, mental, social and environmental scales. In this study, the physical subscale was used to assess perceived physical health. The Cronbach Alpha score of the scale was .83.

Brief Symptom Inventory (BSI). Brief Symptom Inventory is a shortened form of the SCL-90 inventory with 90 items developed by Derogatis and Melisaratos (1983). The scale, which consisted in total of 53 items (e.g., temper outbursts that you cannot control, feeling hopeless about the future) was adapted to Turkish by Şahin and Durak (1994). The scale has five sub-dimensions including depression, anxiety, negative self-concept, somatization and hostility (anger-aggressiveness), and their Cronbach Alpha scores range from .75 to .87. The scale is a 5-point Likert type ('Not at all (0)' and 'extremely (4)'), and high scores received from the scale indicate the frequency of psychological symptoms in individuals.

Marriage Life Scale (MLS). This scale has been developed by Tezer (1996) in order to measure marital satisfaction. The scale consists of a total of 10 items (e.g., 'Most of my expectations from marriage have been realized', 'Our relationship is an ideal husband and wife relationship'). It is a 5-point Likert type (1 = strongly disagree to 5 = strongly agree). High scores obtained from the scale indicate a high level of marital satisfaction. The Cronbach Alpha score of the scale was found to be .88 in the male group and .91 in the female group.

Demographic Information Form. A demographic information form has been prepared in order to collect participants' demographic data. The form presents multiple choice and open-ended questions about age, gender, educational status, marital status, individual and family monthly income, age of marriage etc. In order to determine the socioeconomic status, a composite score was formed by using educational status, individual and family monthly income.

5.3. Procedure

Research data was collected via the convenient sampling method. Research scales were applied to married individuals aged between 40–69 who live in different districts of Ankara and agreed to voluntarily participate in the study. Prior to implementation, individuals were informed about the aim and significance of the

research and they were asked to answer the scales sincerely. The participants were informed that a research was being conducted on various aspects of adult life such as marriage and health. All scales were self-report measures and participants answered the questionnaires anonymously. After obtaining necessary ethical permissions, the scales were personally implemented to participants in their homes or offices. Implementation of scales took between 20–25 minutes.

6. Results

First of all, correlation analysis and descriptive analysis were performed in order to see the relationships between the research variables and the participants' scores. The results have been presented in *Table 1.* Correlation analysis results showed that the relationship between age at the time of marriage and marital satisfaction, and perceived physical health and marital satisfaction, were not significant, but significant correlations did exist between other basic research variables.

Afterwards, a path analysis was conducted in line with the research hypotheses and the proposed model. The path analysis was performed using the AMOS 16.0 (Arbuckle 2007). As a result of the correlation analysis, non-significant paths were not added to the model. A priori, it was decided to use χ^2/df, the root mean square error of approximation (RMSEA), comparative fit index (CFI), goodness of fit index (GFI), adjustment goodness of fit index (AGFI) to evaluate the fit of the model. In the preliminary analyses, some fit indices were not adequate, $\chi^2 = 119.77$, $df = 39$, $p = .000$, χ^2/df = 3,07, RMSEA = .09, CFI = .94, GFI = .93, AGFI = .88. In order to increase the model fit, covariances were added to the error terms of the sub-dimensions of psychological health problems (depression and somatization, negative self-concept and somatization, negative self-concept and hostility, somatization and hostility) in line with modification indexes. After the improvement of the model, it was observed that the research data showed a good fit to the model according to all fit indexes, $\chi^2 = 84.93$, $df = 36$, $p = .000$, χ^2/df = 2.35, RMSEA = .07, CFI = .96, GFI = .95, AGFI = .91. Standardized coefficients for the paths in the model have been presented in *Figure 1.* According to this, marital satisfaction was negatively related to perceived psychological health problems ($\beta = -.23$, $p < .001$); age of marriage was positively related to perceived physical health ($\beta = .15$, $p < .01$); and SES ($\beta = .44$, $p < .001$). Perceived psychological health problems was negatively related to perceived physical health ($\beta = -.46$, $p < .001$). SES was negatively related to perceived psychological health problems ($\beta = -.19$, $p < .01$) and positively related to marital satisfaction ($\beta = .17$, $p < .01$). When the indirect relations of the model were considered, the relationship between marital satisfaction and perceived physical health by means of perceived psychological health was significant) .10 (95% CIs [.05, .16], $p < .001$). The relationship between SES and perceived physical health by means of perceived

Table 1
Mean, standard deviation and correlation values of research variables

Variable	*PH*	*PHP*	*AN*	*DE*	*NS*	*SO*	*HO*	*MS*	*AM*	*ES*	*IMI*	*FMI*	*Total Mean (S)*	*Women Mean (S)*	*Men Mean (S)*
PH	-												3.78 (.56)	3.73 (.58)	3.82 (.53)
PHP	-.46***	-											1.66 (.41)	1.66 (.39)	1.65 (.42)
AN	-38***	.89***	-										1.53 (.43)	1.52 (.42)	1.53 (.44)
DE	-45***	.92***	.75***	-									1.81 (.52)	1.85 (.51)	1.75 (.53)
NS	-35***	.89***	.76***	.76***	-								1.63 (.50)	1.60 (.45)	1.65 (.54)
SO	-50***	.72***	.59***	.65***	.49***	-							1.55 (.42)	1.60 (.45)	1.50 (.38)
HO	-27***	.74***	.59***	.59***	.61***	.39***	-						1.84 (.51)	1.77 (.47)	1.92 (.54)
MS	.11	-.26***	-.23***	-.28***	-.22***	-18***	-.16***	-					3.67 (.78)	3.59 (.85)	3.75 (.68)
AM	.24***	-.19***	-.19***	-.19***	-.11	-.23***	-.04	.12	-				24.14 (4.64)	22.57 (4.46)	25.88 (4.22)
ES	.18**	-.21**	-.12*	-20**	-12*	-.34**	-14*	.12*	.41**	-			3.89 (1.23)	3.76 (1.31)	4.05 (1.12)
IMI	.17**	-.19**	-.14*	-.22**	-.10	-.30**	-.07	.11	.33**	.50**	-		3.93 (1.21)	3.67 (1.15)	4.22 (1.21)
FMI	.12	-.17**	-.11	-.17**	-.09	-.25**	-.10	.14*	.29**	.59**	.62**	-	5.48 (1.28)	5.41 (1.26)	5.56 (1.30)

Note. PH: Physical health, PHP: Psychological Health Problems, AN: Anxiety, DE: Depression, NS: Negative Self-Concept, SO: Somatization, HO: Hostility, MS: Marital Satisfaction, AM: Age of Marriage, ES: Educational status, IMI: Individual monthly income, FMI: Family monthly income.

** $p < .001$; * $p < .01$.

psychological health was significant: .11 (95% CIs [.03, .20], p <.01). Lastly, the relationship between age of marriage and perceived psychological health by means of SES was significant: -.10 (95% CIs [-.03, -.21], p <.01).

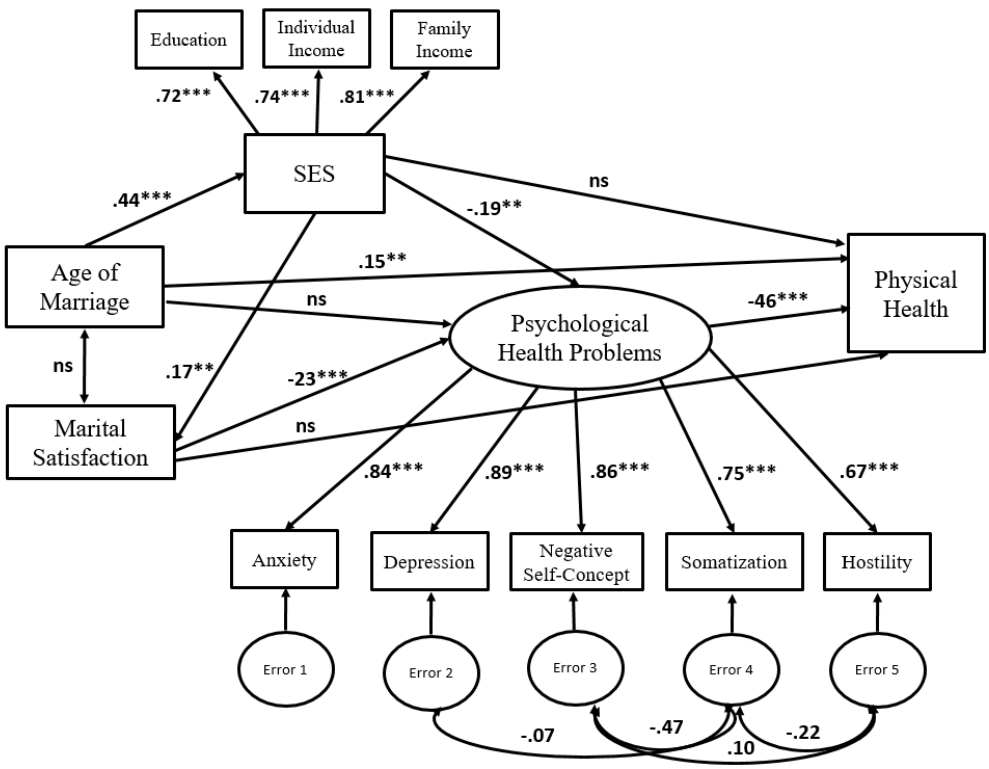

Figure 1
Standardized coefficients for a model of psychological health problems as mediator between age of marriage and, marital satisfaction, SES and physical health

*** p < .001; ** p < .01; ns: nonsignificant.

7. Discussion

In this study, conducted with individuals in middle adulthood, the association between marital satisfaction, age of marriage, SES, perceived psychological and physical health have been examined. In line with relevant literature, it was expected that

marital satisfaction, age of marriage, and SES would be positively related to the perceived psychological and physical health of middle-aged adults. In addition, perceived psychological health would have a mediator role in the relationship between marital satisfaction, age of marriage, SES and perceived physical health; also, SES would have a mediator role in the relationship between age of marriage and perceived psychological health. This study's findings showed that these research hypotheses are partially supported. Accordingly, as marital satisfaction and SES have predicted perceived psychological health problems; the age of marriage and perceived psychological health problems have predicted perceived physical health directly. Also, SES has predicted marital satisfaction, and the age of marriage has predicted SES. However, both marital satisfaction and SES have predicted perceived physical health via perceived psychological health problems. The age of marriage has also predicted perceived psychological health through SES.

Previous studies consistently reported that marriage at an early age is related to negative aspects of individuals' lives such as negative well-being (Johnson et al. 2017; Pekel-Uludağli 2017; Shaud & Asad 2020), and individuals who married at an early age experience more psychological problems (e.g., Carlson 2012; Fakhari et al. 2020). Individuals who married at a younger age do not have the opportunities to develop their educational and career life sufficiently (Falci et al. 2010; Taylor 2009). Indeed, this study showed that getting married earlier was related to adverse economic conditions in line with other studies (Falci et al. 2010; Shpiegel & Cascardi 2018). These disadvantaged conditions stemming from early marriage may cause individuals to experience more stress (Bell & Lee 2006; Falci et al. 2010). The research pointed out that this negative aspect of their lives seems to continue through middle age and was related to their physical health as well as psychological health. The age of marriage has been found to be directly associated with both perceived physical and perceived psychological health by means of SES. Also, adverse socioeconomic conditions were related to increased psychological problems, and these problems predicted worse physical health in midlife. Studies on the age of marriage in the relevant literature revealed the negative consequences of early marriage in many aspects (e.g., Carlson 2012; Johnson et al. 2017; Sener & Terzioğlu 2008). The findings of this study also indicated that the risks of life increase due to the fact that getting married early may cause couples to live in more disadvantaged socioeconomic conditions.

Similar findings were also revealed for marital satisfaction in addition to the age of marriage; it was found that having lower marital satisfaction was related to more psychological problems. Marriage is the main form of relationship in the lives of many individuals, and the problems they experience in this relationship can affect their emotional and cognitive processes (Slatcher 2010). Studies also showed that marriage problems pose an important risk to psychological health (Azizi et al. 2019; Choi & Marks 2008). Individuals who are partnered in a

negative marital relationship suffer from many psychological problems, especially depression (Alipour et al. 2019; Choi & Marks 2008; Whisman & Uebelacker 2003).

As marital satisfaction was directly associated with psychological health, it was also associated with perceived physical health by means of perceived psychological health. Conflicts with the spouse may increase the perceived stress level of individuals and induce negative consequences on their health (Robles & Kiecolt-Glaser 2003; Slatcher 2010). Although related literature has shown that psychological health can play both mediator and moderator roles in the association between the quality of marital relationship and physical health (Chen & Austin 2019; Galinsky & Waite 2014), many studies also exist that show they are directly associated (Bookwala 2005; Galinsky & Waite 2014; Gallo et al. 2003; Grames et al. 2008; Hawkins & Booth 2005; Lawrence et al. 2019; South & Krueger 2013). However, most of these studies evaluated the quality of marriage in terms of negative aspects of marriage, such as negative spousal behaviors and marital distress. The measurement of marital satisfaction used in this study was obtained using a scale that focused on the positive aspects of marriage. Moreover, marital satisfaction and marital conflict were separately examined in a study, and while marital satisfaction was not found to be associated with physical health, it was found that marital conflict was associated with worse health – especially in men (Faulkner et al. 2005). In this context, it was deemed beneficial to consider the positive and negative aspects of marriage separately in studies that would evaluate the interaction between marital relationship and health in the future.

Relevant studies demonstrated that marriage at early age presents a risk for the marital adjustment (e.g., Arshad et al. 2014; Lehrer & Chen 2013; Pekel-Uludağli & Akbaş 2019b; Shaud & Asad 2020). However, it was unexpectedly found that the age of marriage was not related to marital satisfaction in this study. The reason for this difference may be the age of the participants. Because the participants were young adults in these studies (Pekel-Uludağli & Akbaş 2019b; Shaud & Asad 2020), while the participants in this research were middle-aged adults. Middle-aged adults possess different life conditions than young adults. For example, marital satisfaction tends to increase in middle adulthood (Gorchoff et al. 2008). Although marriage at early age negatively affects marital satisfaction in young adulthood, this effect may attenuate in middle age. Also, economic conditions in middle adulthood are better than in other age periods (Twenge & Campbell 2002). It is possible that the marital problems of individuals who marry at an early age may arise at a higher rate from their inadequate economic conditions (Pekel-Uludağli & Akbaş 2019b), and economic problems pose a risk for negative interactions between couples (Neppl et al. 2021). However, the fact remains that socioeconomic conditions still matter in marital relationships in middle-age. This study showed that adverse socioeconomic conditions contribute negatively to marital satisfaction.

8. Implications, limitations, future research directions

Although the age of marriage was directly related to perceived physical health, it was seen that the variable that has the main role on perceived physical health was perceived psychological health. As psychological health directly and strongly predicted physical health, both marital satisfaction and SES were related to perceived physical health through perceived psychological health. In this context, it can be said that people who have marital dissatisfaction and economic hardship have greater psychological problems, which in turn pose a risk for their physical health. Therefore, regarding the findings of the related literature, it is thought that both psychological therapy (Clarke & Currie 2009; Sahmelikoglu-Onur et al. 2019) and marital therapy (Whisman & Uebelacker 2003) should be considered especially by middle-aged individuals who have a chronic health problem or disease, and maintaining the treatment in a multi-component nature may provide effective results.

Research findings on the age of marriage have supported the life course health development approach (Halfon & Forrest 2018); it has shown that developmental differences in the lives of individuals at early ages may result in different effects on their health in later ages. Marrying at an earlier age compared to peers not only differentiates individuals' lives in early years, but it is also a phenomenon that produces effects through middle age and has both physical and psychological consequences by SES. According to UNECE (2017), in Albania, Azerbaijan, Turkey, Kyrgyzstan, and Uzbekistan, the number of marriages under 20 years of age is higher than in other countries. As psychological and social effects of getting married at a young age are known, this study's findings showed that these effects also pose similar risks in terms of physical health. In this context, the importance of informing families about the possible risks of early marriage in the regions where marriage age is low emerges again with the results of this research (Santhya et al. 2008; UNICEF 2005).

Some limitations should be considered in the evaluation of the study findings. First, research data were obtained through cross-sectional design and evaluated on the basis of correlative relations. Although the proposed model basically demonstrates that the age of marriage and marital satisfaction are related to an individual's health, the opposite direction in the proposed model may be possible. For example, most people who have a chronic illness suffer from psychological problems (Ferro 2016; Hu et al. 2016) and marital troubles (Cano et al. 2005; Korporaal et al. 2013). Stronger and more confident assessments for the long-term consequences of the age of marriage and marital satisfaction concerning health will be possible through a longitudinal study. In this context, a longitudinal assessment of individuals, especially in terms of the age of marriage from young adult years to middle and late years, will allow us to make clearer interpretations on its consequences on health. Second, in this study, only individuals' own perceptions were used to evaluate marital satisfaction

and their own health. In some studies, both the individual's own and his/her spouses' health and marital perceptions were evaluated, and it was found that a spouse's low marital satisfaction was also associated with the individual's psychological health (Galinsky & Waite 2014; Miller et al. 2013; Wang et al. 2014). Evaluation of the spouse's health in future studies may provide useful information to predict the health of a married individual. Third, marriage and health are multidimensional concepts. Some factors, such as health habits (smoking, malnutrition, etc.), social-cognitive processes, and personality traits are likely to play a role in the evaluation of the relationship between them (Kiecolt-Glaser & Newton 2001; Margelisch et al. 2015; Robles 2014). Also, gender seems to be important in the relationship between marriage and health. Many studies showed that being married is more beneficial for men's physical health (Kaplan & Kronick 2006; Ploubidis et al. 2015; Wood et al. 2007; Wong et al. 2018) and psychological health (Tumin & Zheng 2018) rather than women's, although marriage problems affect more women than men (Liu & Umberson 2008; Liu & Waite 2014). However, since the numbers of women and men were not sufficient, analyzes could not be conducted separately by gender in this study. In this context, the possible role of these variables in evaluating the relationship between marriage and health should be considered in future studies. Fourth, many people in the world prefer to cohabit instead of getting married and the number of cohabiting adults is increasing (Brown et al. 2017). However, since cohabiting people have different life and relationship characteristics, it is controversial how these findings can be generalized to them. Considering different types of relationships in future research may be useful for more representative results. Also, remarriages differ from first marriages in terms of marital quality (Frye et al. 2020). Therefore, future studies should take into account the possible difference.

As a result, this study has revealed that considering more carefully the marital relationship may be beneficial in order to better understand perceived health during middle age. Especially in terms of age at the time of marriage, displaying the negative aspects of early marriage that persist in middle age is one of the distinctive findings of this study. When individuals get married after becoming mature enough and they have a positive relationship with their spouses, they can have better economic conditions and become psychologically healthier in middle age, which in turn can support them to have better physical well-being. In this context, considering the marital relationship and psychological factors in both treatment and intervention approaches for both young and middle-aged adults may facilitate obtaining more effective results.

References

Abbas, J., M. Aqeel, J. Abbas, B. Shaher, A. Jaffar, J. Sundas & W. Zhang (2019) 'The Moderating Role of Social Support for Marital Adjustment, Depression, Anxiety, and Stress: Evidence from Pakistani Working and Nonworking Women', *Journal of Affective Disorders* 244, 231–38 (https://doi.org/10.1016/j.jad.2018.07.071).

Ahnquist, J., S.P. Wamala & M. Lindstrom (2012) 'Social Determinants of Health – A Question of Social or Economic Capital? Interaction Effects of Socioeconomic Factors on Health Outcomes', *Social Science & Medicine* 74(6), 930–39 (https://doi.org/10.1016/j.socscimed.2011.11.026).

Alipour, Z., A. Kazemi, G. Kheirabadi & A.A. Eslami (2019) 'Relationship Between Marital Quality, Social Support and Mental Health During Pregnancy', *Community Mental Health Journal* 55, 1064–70 (https://doi.org/10.1007/s10597-019-00387-8).

Amuedo-Dorantes, C. & J. Kimmel (2005) 'The Motherhood Wage Gap for Women in the United States: The Importance of College and Fertility Delay', *Review of Economics of the Household* 3*,* 17–48.

Arbuckle, J.L. (2007) *Amos™ 16.0 User's Guide* (Chicago: SPSS).

Arnett, J.J. (2006) Emerging Adulthood: 'Understanding the New Way of Coming of Age' in J.J. Arnett & J.L. Tanner eds., *Emerging Adults in America: Coming of Age in the 21st century* 3–19 (Washington, DC: APA) (https://doi.org/10.1037/11381-001).

Arshad, M., M.N. Mohsin & K. Mahmood (2014) 'Marital Adjustment and Life Satisfaction Among Early and Late Marriages', *Journal of Education and Practice* 5(17), 83–90, retrieved 7 Sep 2021 from https://core.ac.uk/download/pdf/234635874.pdf.

Augustus-Horvath, C.L. & T.L. Tylka (2011) 'The Acceptance Model of Intuitive Eating: A Comparison of Women in Emerging Adulthood, Early Adulthood, and Middle Adulthood', *Journal of Counseling Psychology* 58(1), 110–25 (https://doi.org/10.1037/a0022129).

Azizi, M., E. Fooladi, R.J. Bell, F. Elyasi, M. Masoumi & S.R. Davis (2019) 'Depressive Symptoms and Associated Factors among Iranian Women at Midlife: A Community-Based, Cross-Sectional Study', *Menopause* 26(10), 1125–32 (https://doi.org/10.1097/GME.0000000000001374).

Bell, S. & C. Lee (2006) 'Does Timing and Sequencing of Transitions to Adulthood Make a Difference? Stress, Smoking, and Physical Activity among Young Australian Women', *International Journal of Behavioral Medicine* 13, 265–74.

Bookwala, J. (2005) 'The Role of Marital Quality in Physical Health During the Mature Years', *Journal of Aging and Health* 17(1), 85–104 (https://doi.org/10.1177/0898264304272794).

Bookwala, J. (2015) 'Marital Relationships and Quality' in S.K Whitbourne, ed., *The encyclopedia of adulthood and aging 1 – 5* (Hoboken: Wiley) (http://doi.org/10.1002/9781118521373.wbeaa282).

Borrell-Carrió, F., A.L. Suchman & R.M. Epstein (2004) 'The Biopsychosocial Model 25 Years Later: Principles, Practice, and Scientific Inquiry', *The Annals of Family Medicine* 2(6), 576–82 (https://doi.org/10.1370/afm.245).

Brand, J.E. & D. Davis (2011) 'The Impact of College Education on Fertility: Evidence for Heterogeneous Effects', *Demography* 48(3), 863–87 (https://doi.org/10.1007/s13524-011-0034-3).

Brown, S.L., W.D. Manning & K.K. Payne (2017) 'Relationship Quality Among Cohabiting Versus Married Couples', *Journal of Family Issues* 38(12), 1730–53 (https://doi.org/10.1177/0192513X15622236).

Cano, A., A.B. Johansen & J.D. Hanawalt (2005) 'What Are the Marital Problems of Patients with Chronic Pain?' *Current Pain and Headache Reports* 9, 96–100 (https://doi.org/10.1007/s11916-005-0045-0).

Carlson, D.L. (2012) 'Deviations from Desired Age at Marriage: Mental Health Differences Across Marital Status', *Journal of Marriage and Family* 74(4), 743–58. (https://doi.org/10.1111/j.1741-3737.2012.00995.x).

Channon, M., V. Hosegood & N. McGrath (2016) 'A Longitudinal Population-Based Analysis of Relationship Status and Mortality in Kwazulu-Natal, South Africa 2001–2011', *Journal of Epidemiology & Community Health* 70, 56–64 (https://doi.org/10.1136/jech-2014-205408).

Chen, R. & J.P. Austin (2019) 'Depression as a Moderator and a Mediator of Marital Quality's Effect on Older Adults' Self-Rated Physical Health', *Archives of Gerontology and Geriatrics* 83, 50–54 (https://doi.org/10.1016/j.archger.2019.03.026).

Choi, H. & N.F. Marks (2008) 'Marital Conflict, Depressive Symptoms, and Functional Impairment', *Journal of Marriage and Family* 70(2), 377 – 90 (https://doi.org/10.1111/j.1741-3737.2008.00488.x).

Choi, H., J.B. Yorgason & D.R. Johnson (2016) 'Marital Quality and Health in Middle and Later Adulthood: Dyadic Associations', *Journals of Gerontology Series B* 71(1), 154–64 (https://doi.org/10.1093/geronb/gbu222).

Chopik, W.J. (2017) 'Associations Among Relational Values, Support, Health, and Well-Being Across the Adult Lifespan', *Personal Relationships* 24(2), 408–22 (https://doi.org/10.1111/pere.12187).

Clarke, D.M. & K.C. Currie (2009) 'Depression, Anxiety and Their Relationship with Chronic Diseases: A Review of the Epidemiology, Risk and Treatment Evidence', *The Medical Journal of Australia* 190(S7), S54 – S60 (https://doi.org/10.5694/j.1326-5377.2009.tb02471.x).

Demir, E. (2014) *Farklı denetim odağına sahip evli bireylerin evlilik doyumlarının incelenmesi* [A study on marital satisfaction of married individuals with different

locus of control] (Master thesis, Gazi University, Ankara) retrieved from https://tez.yok.gov.tr/UlusalTezMerkezi/.

Derogatis, L.R. & N. Melisaratos (1983) 'The Brief Symptom Inventory: An Introductory Report', *Psychological Medicine* 13(3), 595–605 (https://doi.org/10.1017/S0033291700048017).

Diez-Roux, A.V. (2007) 'Integrating Social and Biologic Factors in Health Research: A Systems View', *Annals of Epidemiology* 17(7), 569–74 (https://doi.org/10.1016/j.annepidem.2007.03.001).

Dupre, M.E. & S.O. Meadows (2007) 'Disaggregating the Effects of Marital Trajectories on Health', *Journal of Family Issues* 28(5), 623–52 (https://doi.org/10.1177/0192513X06296296).

Eser, E., H. Fidaner, C. Fidaner, S.Y. Eser, H. Elbi & E. Göker (1999) 'WHOQOL-100 ve WHOQOL-BREF'in psikometrik özellikleri' [Psychometric properties of the WHOQOL-100 and WHOQOL-BREF], [*Journal of Psychiatry, Psychology, Psychopharmacology]* 7(2), 23–40, retrieved 18 Sep 2021 from https://www.researchgate.net/profile/Erhan-Eser/publication/291870682_Whoqol-100_and_psychometric_characteristics_of_WHOQOL-bref/links/584817e808aeda696825d91e/Whoqol-100-and-psychometric-characteristics-of-WHOQOL-bref.pdf.

Eurostat (2020) *Mean Age at First Marriage by Sex*, retrieved 7 Sep 2021 from https://ec.europa.eu/eurostat/databrowser/view/tps00014/default/table?lang=en.

Fakhari, A., M. Farahbakhsh, H. Azizi, E.D. Esmaeili, M. Mirzapour, V.A. Rahimi, L. Hashemi & S. Gaffarifam (2020) 'Early Marriage and Negative Life Events Affect on Depression in Young Adults and Adolescents', *Archives of Iranian Medicine* 23(2), 90–98.

Falci, C.D., J.T. Mortimer & H.J. Noel (2010) 'Parental Timing and Depressive Symptoms in Early Adulthood', *Advances in Life Course Research* 15(1), 1–10. (https://doi.org/10.1016/j.alcr.2010.05.001).

Faulkner, R.A., M. Davey & A. Davey (2005) 'Gender-Related Predictors of Change in Marital Satisfaction and Marital Conflict', *The American Journal of Family Therapy* 33(1), 61–83 (https://doi.org/10.1080/01926180590889211).

Ferro, M.A. (2016) 'Major Depressive Disorder, Suicidal Behaviour, Bipolar Disorder, and Generalised Anxiety Disorder Among Emerging Adults with and without Chronic Health Conditions', *Epidemiology and Psychiatric Sciences* 25(5), 462–74 (https://doi.org/10.1017/S2045796015000700).

Frye, N., L. Ganong, T. Jensen & M. Coleman (2020) 'A Dyadic Analysis of Emotion Regulation as a Moderator of Associations Between Marital Conflict and Marital Satisfaction Among First-married and Remarried Couples', *Journal of Family Issues* 41(12), 2328–55 (https://doi.org/10.1177/0192513X20935504).

Galinsky, A.M. & L.J. Waite (2014) 'Sexual Activity and Psychological Health as Mediators of the Relationship Between Physical Health and Marital Quality',

The Journals of Gerontology: Series B 69(3), 482–92 (https://doi.org/10.1093/geronb/gbt165).

Gallo, L.C., W.M. Troxel, K.A. Matthews & L.H. Kuller (2003) 'Marital Status and Quality in Middle-Aged Women: Associations with Levels and Trajectories of Cardiovascular Risk Factors', *Health Psychology* 22(5), 453–63 (https://doi.org/10.1037/0278-6133.22.5.453).

Gorchoff, S.M., O.P. John & R. Helson (2008) 'Contextualizing Change in Marital Satisfaction During Middle Age: An 18-Year Longitudinal Study', *Psychological Science* 19(11), 1194–1200 (https://doi.org/10.1111/j.1467-9280.2008.02222.x).

Grames, H. A., R.B. Miller, W.D. Robinson, D.J. Higgins & W.J. Hinton (2008) 'A Test of Contextual Theory: The Relationship Among Relational Ethics, Marital Satisfaction, Health Problems, and Depression', *Contemporary Family Therapy* 30, 183–98 (https://doi.org/10.1007/s10591-008-9073-3).

Hajihasani, M. & T. Sim (2019) 'Marital Satisfaction Among Girls with Early Marriage in Iran: Emotional Intelligence and Religious Orientation', *International Journal of Adolescence and Youth* 24(3), 297–306 (https://doi.org/10.1080/02673843.2018.1528167).

Halfon, N. & C.B. Forrest (2018) 'The Emerging Theoretical Framework of Life Course Health Development' in N. Halfon, C. Forrest, R. Lerner & E. Faustman, eds., *Handbook of Life Course Health Development*, 19–46 (Cham: Springer) (https://doi.org/10.1007/978-3-319-47143-3_2).

Halfon, N., C.B. Forrest, R.M. Lerner, E.M. Faustman, E. Tullis & J. Son (2018) 'Introduction to the Handbook of Life Course Health Development' in N. Halfon, C. Forrest, R. Lerner & E. Faustman, eds., *Handbook of Life Course Health Development,* 1–16 (Cham: Springer) (https://doi.org/10.1007/978-3-319-47143-3_1).

Hamilton, V.E. (2012) 'The Age of Marital Capacity: Reconsidering Civil Recognition of Adolescent Marriage', *College of William & Mary Law School Faculty Publications* 1430, retrieved 8 Sep 2021 from https://scholarship.law.wm.edu/facpubs/1430.

Hawkins, D.N. & A. Booth (2005) 'Unhappily Ever After: Effects of Long-Term, Low-Quality Marriages on Well-Being', *Social Forces* 84(1), 451–71, retrieved 8 Sep 2021 from https://www.jstor.org/stable/3598312.

Holt-Lunstad, J., W. Birmingham & B.Q. Jones (2008) 'Is There Something Unique About Marriage? The Relative Impact of Marital Status, Relationship Quality, and Network Social Support on Ambulatory Blood Pressure and Mental Health', *Annals of Behavioral Medicine* 35(2), 239–44 (https://doi.org/10.1007/s12160-008-9018-y).

Hu, S.X.X., W.I. Lei, K.K. Chao, B.J. Hall & S.F. Chung (2016) 'Common Chronic Health Problems and Life Satisfaction Among Macau Elderly People', *Inter-*

national Journal of Nursing Sciences 3(4), 367–70 (https://doi.org/10.1016/j.ijnss.2016.10.004).

Jaremka, L.M., R. Glaser, W.B. Malarkey & J.K. Kiecolt-Glaser (2013) 'Marital Distress Prospectively Predicts Poorer Cellular Immune Function', *Psychoneuroendocrinology* 38(11), 2713–19 (http://dx.doi.org/10.1016/j.psyneuen.2013.06.031).

Johnson, M.D., H.J. Krahn & N.L. Galambos (2017) 'Better Late Than Early: Marital Timing and Subjective Well-Being in Midlife', *Journal of Family Psychology* 31(5), 635–41 (https://doi.org/10.1037/fam0000297).

Kaplan, R.M. & R.G. Kronick (2006) 'Marital Status and Longevity in the United States Population', *Journal of Epidemiology & Community Health* 60, 760–65 (https://doi.org/10.1136/jech.2005.037606).

Keenan, K., G.B. Ploubidis, R.J. Silverwood & E. Grundy (2017) 'Life-Course Partnership History and Midlife Health Behaviours in a Population-Based Birth Cohort', *Journal of Epidemiology & Community Health* 71, 232–38 (https://doi.org/10.1136/jech-2015-207051).

Kendig, H., P.A. Dykstra, R.I. van Gaalen & T. Melkas (2007) 'Health of Aging Parents and Childless Individuals', *Journal of Family Issues* 28(11), 1457–86 (https://doi.org/10.1177/0192513X07303896).

Kiecolt-Glaser, J.K. & T.L. Newton (2001) 'Marriage and Health: His and Hers', *Psychological Bulletin* 127(4), 472–503 (https://doi.org/10.1037/0033-2909.127.4.472).

Kiecolt-Glaser, J.K., S.J. Wilson, M.L. Bailey, R. Andridge, J. Peng, L.M. Jaremka, C.P. Fagundes, W.B. Malarkey, B. Laskowski & M.A. Belury (2018) 'Marital Distress, Depression, and a Leaky Gut: Translocation of Bacterial Endotoxin as a Pathway to Inflammation', *Psychoneuroendocrinology* 98, 52–60 (https://doi.org/10.1016/j.psyneuen.2018.08.007).

Korporaal, M., M.I. Broese van Groenou & T.G. van Tilburg (2013) 'Health Problems and Marital Satisfaction Among Older Couples', *Journal of Aging and Health* 25(8), 1279–98 (https://doi.org/10.1177/0898264313501387).

Lawrence, E.M., R.G. Rogers, A. Zajacova & T. Wadsworth (2019) 'Marital Happiness, Marital Status, Health, and Longevity', *Journal of Happiness Studies* 20, 1539–61 (https://doi.org/10.1007/s10902-018-0009-9).

Lehrer, E.L. (2008) 'Age at Marriage and Marital Instability: Revisiting the Becker–Landes–Michael Hypothesis', *Journal of Population Economics* 21, 463–84 (https://doi:10.1007/s00148-006-0092-9).

Lehrer, E.L. & Y. Chen (2013) 'Delayed Entry into First Marriage and Marital Stability: Further Evidence on the Becker-Landes-Michael Hypothesis', *Demographic Research* 29, 521–42 (https://doi.org/10.4054/DemRes.2013.29.20).

Liu, H. & D.J. Umberson (2008) 'The Times They Are a Changin': Marital Status and Health Differentials from 1972 to 2003', *Journal of Health and Social Behavior* 49(3), 239–53 (https://doi.org/10.1177/002214650804900301).

Liu, H. & L. Waite (2014) 'Bad Marriage, Broken Heart? Age and Gender Differences in the Link Between Marital Quality and Cardiovascular Risks among Older Adults', *Journal of Health and Social Behavior* 55(4), 403–23 (https://doi.org/10.1177/0022146514556893).

Margelisch, K., K.A. Schneewind, J. Violette & P. Perrig-Chiello (2015) 'Marital Stability, Satisfaction and Well-Being in Old Age: Variability and Continuity in Long-Term Continuously Married Older Persons', *Aging & Mental Health* 21(4), 389–98 (https://doi.org/10.1080/13607863.2015.1102197).

Melnikas, A.J. & D. Romero (2020) 'Ideal Age at First Birth and Associated Factors Among Young Adults in Greater New York City: Findings from the Social Position and Family Formation Study', *Journal of Family Issues* 41(3), 288–311 (https://doi.org/10.1177/0192513X19875762).

Miller, R.B., T.M. Mason, J.M. Canlas, D. Wang, D.A. Nelson & C.H. Hart (2013) 'Marital Satisfaction and Depressive Symptoms in China', *Journal of Family Psychology* 27(4), 677–82 (https://doi.org/10.1037/a0033333).

Neppl, T.K., O.N. Diggs, K.A.S. Wickrama & C. Walker O'Neal (2021) 'Pathways of the Family Stress Model in Midlife on Physical Health in Later Adulthood', *Journal of Family Psychology* 35(1), 22–32 (https://doi.org/10.1037/fam0000714).

Niedhammer, I., S. Kerrad, S. Schütte, J.F. Chastang & C.C. Kelleher (2013) 'Material, Psychosocial and Behavioural Factors Associated with Self-Reported Health in the Republic of Ireland: Cross-Sectional Results from the SLAN Survey', *BMJ Open* 3(5), e002797 (http://dx.doi.org/10.1136/bmjopen-2013-002797).

Pekel-Uludağli, N. (2017) 'Psikolojik sağlık açısından yetişkin olma' [Becoming adult from the perspective of psychological health], *Psikiyatride Güncel Yaklaşımlar* [Current Approaches in Psychiatry] 9(3), 263–83 (https://doi.org/10.18863/pgy.285949).

Pekel-Uludağli, N. & G. Akbaş (2019a) 'Evlilik ile çocuk sahibi olmaya ilişkin sosyal saat algısı ve evlilik doyumu' [The perception of social clock for marriage and having a child and marital satisfaction], *Sosyal Politika Çalışmaları Dergisi* [Journal of Social Policy Studies] 42, 183–219 (https://doi.org/10.21560/spcd.vi.546772).

Pekel-Uludağli, N. & G. Akbaş (2019b) 'Young Adults' Perceptions of Social Clock and Adulthood Roles in the Turkish Population', *Journal of Adult Development* 26, 105–15 (https://doi.org/10.1007/s10804-018-9298-9).

Ploubidis, G.B., R.J. Silverwood, B. DeStavola & E. Grundy (2015) 'Life-Course Partnership Status and Biomarkers in Midlife: Evidence from the 1958 British Birth Cohort', *American Journal of Public Health* 105, 1596–1603 (https://doi.org/10.2105/AJPH.2015.302644).

Prigerson, H.G., P.K. Maciejewski & R.A. Rosenheck (1999) 'The Effects of Marital Dissolution and Marital Quality on Health and Health Service Use Among Women', *Medical Care* 37(9), 858 – 73 (https://doi.org/10.1097/00005650-199909000-00003).

Robles, T.F. (2014) 'Marital Quality and Health: Implications for Marriage in the 21st Century', *Current Directions in Psychological Science* 23(6), 427–32 (https://doi.org/10.1177/0963721414549043).

Robles, T.F. & J.K. Kiecolt-Glaser (2003) 'The Physiology of Marriage: Pathways to Health', *Physiology & Behavior* 79(3), 409–16 (https://doi.org/10.1016/S0031-9384(03)00160-4).

Robles, T.F., R.B. Slatcher, J.M. Trombello & M.M. McGinn (2014) 'Marital Quality and Health: A Meta-Analytic Review', *Psychological Bulletin* 140(1), 140–87 (https://doi.org/10.1037/a0031859).

Sahmelikoglu-Onur, O., D.H. Ertem, C. Karsidag, D. Uluduz, A. Ozge, A. Siva & M. Guru (2019) 'An Open/Pilot Trial of Cognitive Behavioral Therapy in Turkish Patients with Refractory Chronic Migraine', *Cognitive Neurodynamics* 13, 183–89 (https://doi.org/10.1007/s11571-019-09519-y).

Sandberg, J.G., J.B. Yorgason, R.B. Miller & E.J. Hill (2012) 'Family-To-Work Spillover in Singapore: Marital Distress, Physical and Mental Health, and Work Satisfaction', *Family Relations* 61(1), 1–15 (https://doi.org/10.1111/j.1741-3729.2011.00682.x).

Santhya, K.G., S.J. Jejeebhoy & S. Ghosh (2008) *Early Marriage and Sexual and Reproductive Health Risks: Experiences of Young Women and Men in Andhra Pradesh and Madhya Pradesh, India* (New Delhi: Population Council) retrieved 8 Sep 2021 from https://www.ohchr.org/Documents/Issues/Women/WRGS/ForcedMarriage/NGO/PopulationCouncil22.pdf.

Santrock, J. (2018) *Life-Span Development* (17th ed., New York: Mc Graw Hill).

Schneiderman, N., G. Ironson & S.D. Siegel (2005) 'Stress and Health: Psychological, Behavioral, and Biological Determinants', *Annual Review of Clinical Psychology* 1, 607–28 (https://doi.org/10.1146/annurev.clinpsy.1.102803.144141).

Shaud, S. & S. Asad (2020) 'Marital Adjustment, Convergent Communication Patterns, and Psychological Distress in Women with Early and Late Marriage', *Current Psychology* 39, 2326–33 (https://doi.org/10.1007/s12144-018-9936-1).

Shpiegel, S. & M. Cascardi (2018) 'The Impact of Early Childbirth on Socioeconomic Outcomes and Risk Indicators of Females Transitioning out of Foster Care', *Children and Youth Services Review* 84, 1–8 (https://doi.org/10.1016/j.childyouth.2017.11.001).

Slatcher, R.B. (2010) 'Marital Functioning and Physical Health: Implications for Social and Personality Psychology', *Social and Personality Psychology Compass* 4(7), 455–69 (https://doi.org/10.1111/j.1751-9004.2010.00273.x).

Slatcher, R.B. & E. Selcuk (2017) 'A Social Psychological Perspective on the Links Between Close Relationships and Health', *Current Directions in Psychological Science* 26(1), 16–21 (https://doi.org/10.1177/0963721416667444).

South, S.C. & R.F. Krueger (2013) 'Marital Satisfaction and Physical Health: Evidence for an Orchid Effect', *Psychological Science* 24(3), 373–78 (https://doi.org/10.1177/0956797612453116).

Steinberg, L., M.H. Bornstein, D.L. Vandell & K.S. Rook (2010) *Life-Span Development: Infancy Through Adulthood* (San Francisco: Wadsworth Cengage Learning).

Sutton, C.J., J. Marsden, C.L. Watkins, M.J. Leathley & P. Dey (2010) 'Changing Stroke Mortality Trends in Middle-Aged People: An Age–Period–Cohort Analysis of Routine Mortality Data in Persons Aged 40 to 69 In England', *Journal of Epidemiology & Community Health* 64(6), 523–29 (https:/doi.org/10.1136/jech.2008.086785).

Şahin, N.H. & A. Durak (1994) 'Kısa Semptom Envanteri: Türk gençleri için uyarlanması' [Brief Symptom Invetory-BSI: A study of the Brief Symptom Inventory in Turkish Youth], *Türk Psikoloji Dergisi* [Turkish Journal of Psychology] 9(31), 44–56.

Şener, A. & G. Terzioğlu (2008) 'Bazı sosyoekonomik ve demografik değişkenler ile iletişimin eşler arası uyuma etkisinin araştırılması' [Study on some socio-economic and demographic variables and communication effect on the marital adjustment], *Aile ve Toplum* [Journal of Social Policy Studies] 13(13), 7–20, retrieved 10 Sep 2021 from https://dergipark.org.tr/en/pub/spcd/issue/21113/227411.

Taylor, J.L. (2009) 'Midlife Impacts of Adolescent Parenthood', *Journal of Family Issues* 30(4), 484–510 (https://doi.org/10.1177/0192513X08329601).

Tezer, E. (1996) 'Evlilik ilişkisinden sağlanan doyum: Evlilik Yaşam Ölçeği' [The satisfaction that is experienced by the marital relationship: Marital Life Scale], *Türk Psikolojik Danışma ve Rehberlik Dergisi* [Turkish Psychological Counseling and Guidance Journal] 2(7), 1 – 7, retrieved 9 Sep 2021 from https://dergipark.org.tr/tpdrd/issue/21427/229707.

Tumin, D. & H. Zheng (2018) 'Do the Health Benefits of Marriage Depend on the Likelihood of Marriage?', *Journal of Marriage and Family* 80(3), 622–36 (https://doi.org/10.1111/jomf.12471).

Turkish Statistical Institute (TSI) (2021) 'Marriage and Divorce Statistics 2020', *Turkish Statistical Institute Newsletter* 37211, retrieved 8 Sep 2021 from https://data.tuik.gov.tr/Bulten/Index?p=Evlenme-ve-Bosanma-Istatistikleri-2020-37211.

Twenge, J.M. & W.K. Campbell (2002) 'Self-Esteem and Socioeconomic Status: A Meta-Analytic Review', *Personality and Social Psychology Review* 6(1), 59–71 (https://doi.org/10.1207/S15327957PSPR0601_3).

Uchino, B.N. (2006) 'Social Support and Health: A Review of Physiological Processes Potentially Underlying Links to Disease Outcomes', *Journal of Behavioral Medicine* 29(4), 377–87 (https://doi.org/10.1007/s10865-006-9056-5).

UNICEF (2005) *Early Marriage: A Harmful Traditional Practice: A Statistical Exploration* (New York: United Nations Children's Fund), retrieved 10 Sep 2021 from https://data.unicef.org/wp-content/uploads/2015/12/childmarriage_EarlyMarriageFinal_92.pdf

United Nations Economic Commission for Europe (UNECE) (2017) *Women's Age at First Marriage Varies Widely in the UNECE Region*, retrieved 9 Sep 2021 from https://www.unece.org/info/media/news/statistics/2017/womens-age-at-first-marriage-varies-widely-in-the-unece-region/doc.html.

Waite, L.J. & E.L. Lehrer (2003) 'The Benefits from Marriage and Religion in the United States: A Comparative Analysis', *Population and Development Review* 29(2), 255–76.

Waite, L.J., Y. Luo & A.C. Lewin (2009) 'Marital Happiness and Marital Stability: Consequences for Psychological Well-Being', *Social Science Research* 38(1), 201–12 (https://doi.org/10.1016/j.ssresearch.2008.07.001).

Wang, Q., D. Wang, C. Li & R.B. Miller (2014) 'Marital Satisfaction and Depressive Symptoms among Chinese Older Couples', *Aging & Mental Health* 18(1), 11–18 (https://doi.org/10.1080/13607863.2013.805730).

Whisman, M.A. & L.A. Uebelacker (2003) 'Comorbidity of Relationship Distress and Mental and Physical Health Problems' in D.K. Snyder & M.A. Whisman eds., *Treating Difficult Couples: Helping Clients with Coexisting Mental and Relationship Disorders* (New York: Guilford) 3–26.

Whisman, M.A., A.L. Gilmour & J.M. Salinger (2018) 'Marital Satisfaction and Mortality in the United States Adult Population', *Health Psychology* 37(11) 1041–44 (https://doi.org/10.1037/hea0000677).

Widyastari, D.A., P. Isarabhakdi, P. Vapattanawong & M. Völker (2020) 'Marital Dissolution in Postmodern Java, Indonesia: Does Early Marriage Increase the Likelihood to Divorce?', *Journal of Divorce & Remarriage* 61(8), 556–73 (https://doi.org/10.1080/10502556.2020.1799308).

Wilson, C.M. & A.J. Oswald (2005) 'How Does Marriage Affect Physical and Psychological Health? A Survey of the Longitudinal Evidence', *The Warwick Economic Research Paper Series* 1–31, retrieved 9 Sep 2021 from https://www.researchgate.net/publication/5135843_How_Does_Marriage_Affect_Physical_and_Psychological_Health_A_Survey_of_the_Longitudinal_Evidence.

Wilson, S.J., B.E. Bailey, W.B. Malarkey & J.K. Kiecolt-Glaser (2021) 'Linking Marital Support to Aging-Related Biomarkers: Both Age and Marital Quality Matter', *The Journals of Gerontology: Series B* 76(2), 273–82 (https://doi.org/10.1093/geronb/gbz106).

Wong, C.W., C.S. Kwok, A. Narain, M. Gulati, A.S. Mihalidou, P. Wu, M. Alasnag, P.K. Myint & M.A. Mamas (2018) 'Marital Status and Risk of Cardiovascular Diseases: A Systematic Review and Meta-Analysis', *Heart* 104(23), 1937–48 (https://doi.org/10.1136/heartjnl-2018-313005).

Wood, R.G., B. Goesling & S. Avellar (2007) *The Effect of Marriage on Health: A Synthesis of Recent Research Evidence* (Washington: Mathematica Policy Research) retrieved 9 Sep 2021 from https://aspe.hhs.gov/sites/default/files/private/pdf/75106/report.pdf.

World Health Organization (1996) *WHOQOL-BREF: Introduction, Administration, Scoring and Generic Version of the Assessment: Field Trial Version, December 1996* (Geneva: World Health Organization) retrieved 9 Sep 2021 from https://apps.who.int/iris/handle/10665/63529.

World Health Organization (2014) *Basic Documents (48th ed.)* retrieved 9 Sep 2021 from https://apps.who.int/gb/bd/PDF/bd48/basic-documents-48th-edition-en.pdf.

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RESILIENCE FACTORS, THE SCHOOL-BASED UNIVERSAL PREVENTION PROGRAM 'UNPLUGGED' AND HEALTHY BEHAVIOR AMONG EARLY ADOLESCENTS**

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The paper investigates the role of the internal asset (IA), perceived external resources (PER) of resilience, and the school-based universal prevention program known as 'Unplugged' in explaining persistent healthy behavior among early adolescence. A sample of 425 adolescents was collected in a repeated measure design study with a baseline (T1) and a six-month follow-up (T2) after the Unplugged implementation. Persistent healthy behavior was assessed by a change in the cumulative index of substance use created by combining alcohol use and cigarette smoking in the past 30 days and their change between T1 and T2. Four categories were created: non-users, permanent users, new users and ex-users. A multinominal logistic regression revealed that non-users were more likely to show higher self-esteem when compared to permanent users. Females had a higher probability of being non-users than either being permanent users or new users. Moreover, Unplugged intervention increased the probability of being a non-user rather than a new user. Regarding PER of resilience, non-users were more likely to have higher home support, prosocial peers, and school connectedness compared to permanent users. Non-users were also more likely to have higher levels of prosocial peers compared to new users. In summary, higher self-esteem, home support, prosocial peers and school connectedness are associated with persistent healthy behavior. To maintain this persistent healthy behavior, the school-based universal prevention program Unplugged has been effective; thus internal assets and external resources of resilience, and prevention program Unplugged, play an important role in the absence of alcohol or cigarette use in early teenage years.

Key words: adolescence; alcohol use; cigarette smoking; resilience; prevention programs; Unplugged

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1. Introduction

The period of early adolescence stands as a period of significant changes in human life. The transition from childhood to adolescence is accompanied by biological, social, and emotional changes (DiClemente et al. 2013). Social pressure increases, changes in health behavior occur and new adaptation skills are in development. It is also a risk period for an early onset of substance use which can set off deviant trajectories for young people in their lives and even lead to long term disabilities (Castellanos-Ryan et al. 2013). Identification of protective personality factors that can be strengthened, and in environment factors which are accessible for adolescents, can bring forth a broader insight into what is really available for early adolescents and what can be done to promote the protective factors, eliminate the risks, and remain healthy. Moreover, various prevention programs aim to prevent young adolescents from engaging in risk behavior or at least delay the onset to a later life period and enhance positive and healthy development.

Past research strongly suggests that alcohol use and cigarette smoking are consistently the most prevalent drugs used among adolescents (WHO 2013; ESPAD 2016). Data from the ESPAD study show that generally 47% of respondents reported alcohol use at the age of 13 or younger (in Slovakia 63%), while 23% of respondents reported cigarette smoking at the age of 13 or younger (in Slovakia 36%) (ESPAD 2016). This indicates that alcohol is the first drug of choice to use among adolescents in Europe. However, the earlier the age of the onset of substance use, the higher the probability of a negative effect in the future regarding mental health problems (Poudel & Gautam 2017) or dependence on drugs (King & Chassin 2007).

Although the studies of individual substance use (typically alcohol, tobacco, or marihuana) provide useful information, in the past few decades, the research shifted from an individual risk behavior research to multiple substance use research (Kokkevi et al. 2014; Lipperman-Kreda et al. 2017). Less research activity is focused on a cumulative index of substance use which combines alcohol use and cigarette smoking. The reason for combining the two most frequent risk behaviors in adolescence is the fact that they have common factors which enhance addictions starting in adolescence (Nowak et al. 2018). It is necessary to investigate the first signs of substance use in early adolescence, which occurs mostly through using alcohol or cigarettes (Poudel & Gautam 2017). A lot of research has been done regarding personality and environmental risk factors associated with substance use in early age. The development of prevention models based on the resilience model have enabled a shift in focus from risk factors to positive factors of adolescents' healthy development and contributed to a growing research in resilience theory (Van Breda 2018; Masten 2007; Masten 2014).

The resilience framework implies the focus on positive outcomes and their antecedents, favoring primary prevention which could delay the period of onset or

prevent the use itself (Luthar et al. 2000). From this broader perspective, resilience can be understood as the ability of the system to successfully adapt to the challenges that threaten the function, survival or future development of the system (Masten 2014). The process oriented approach views resilience as a dynamic process rather than a personality trait bounded by the body and mind of an individual (Luthar et al. 2000; Fergus & Zimmerman 2005) and represents an active participation in processes that enable positive development outcomes to happen. Resilience is therefore not only a quality of an individual but reflects how well the social and physical environment (home, school, family, friends) promotes access to internal and external resources such as supportive relationships, strong identity, material needs and meaningful participation (Ungar 2004).

The examination of innate resilience characteristics has had a dominant position in the field of resilience research. This can be seen in focusing on factors related to self-system, for example: self-regulation (Cadima et al. 2006; Wills et al. 2008) and self-esteem (Kokkevi et al. 2014; Donnelly et al. 2008), which possess protective potential. However, protective resources can also be detected in environmental systems in which child development is set, such as families, classes, or schools that are labeled as social environments (Van Breda 2018). Therefore, environmental resilience promoting factors in early adolescence can be divided into four broad levels: family, school, peer group and community (Rudzinski et al. 2017; Hodder et al. 2016) which are rapidly changing during the transition period from childhood to adolescence. The influence of peers increases during adolescence (Gaertner et al. 2010), parents' influence decreases but remains an important factor in adolescent development (Kung & Farrell 2000), and schools and communities become primary social contexts outside the home where a wide range of peer and social interactions take place (Institute of Medicine and National Research Council 2011). It is crucial that adolescents acquire support and are actively involved in all the mentioned environmental levels for the health behavior promoting effect. Meaningful participation may serve as social control, keeping adolescents away from substance use, because their time and energy would be already committed in socially approved activities, extracurricular activities and decision making (Osgood et al. 1996). Moreover, support across different kinds of environments is positively associated with non or small amounts of substance use, and it is seen as a protective factor (Hodder at al. 2016). However, it should be crucial to acknowledge the adolescents' perception of their environment rather than how it may objectively appear. It is precisely the perception of possible support and meaningful participation in the environment that can be protective against risk behavior.

The idea behind the umbrella approach of resilience sheltering internal factors and external resources is to contribute to healthy outcomes among youth (Benard 2004; Benard & Slade 2009). Several theories and models have been introduced to understand resilience from the environmental perspective to emphasize the sur-

roundings such as socio-ecological model (Bronfenbrenner 1979), or the PIE – Person in Environment model (Van Breda 2018). These models consider the complex interplay between personality and environment in which adolescents live. The ultimate goal of the research in resilience theory is to enhance the protective factors and to better understand determinants of substance use with the intention to enrich prevention strategies and bring valued insight of what youths actually have in their hands, in their minds, and in their surroundings, and most importantly what can be improved.

Besides the identification of resilience factors that contribute to healthy behavior, universal school-based prevention programs represent an opportunity to reduce the prevalence of substance use or delay it to later periods. Early adolescents are often targeted as a group for school-based drug prevention programs based on the strategy that the earlier exposure to prevention the better. One of the prevention programs regarding substance use which was specifically created to meet the demand for a prevention program in Europe is the Unplugged program. Unplugged aims to prevent the use of alcohol, tobacco, marihuana and other legal and illegal drugs among early adolescents. Its main goal is to prevent or delay substance use in young people regardless of their risk profile and the environment from which they come from (Bohrn et al. 2008). The effectiveness of Unplugged has been tested regarding behavioral indicators in various countries, including Slovenia (Alesina et al. 2014) particularly on reduction of alcohol use, cigarette smoking and drunkenness; Czech Republic (Gabrhelik et al. 2012) on reduction of current tobacco use and marihuana use; Brazil (Sanchez et al. 2016) on reduction of marihuana use and binge drinking. Unplugged indicated persistent positive effects in reducing alcohol consumption and cannabis use among early adolescents within 18 months (Faggiano et al. 2010) and the prevalence of smoking and drunkenness two years after the program implementation (Miovský et al. 2012).

2. Aim

Based on previous findings, the relationship between internal assets, perceived external resources of resilience and healthy behavior has been widely established while little attention has been paid to this issue within the Unplugged program. The nature of these relationships and changes of healthy behavior within Unplugged deserve more attention. Thus, the main aim of the present study is to explore whether internal assets and perceived external resources of resilience within Unplugged can predict health behavior represented by a change in cumulative index of substance use.

3. Design and measurements

3.1. Research design

The school-based universal prevention program Unplugged was created as a part of the Eu-DAP (European Drug Abuse Prevention) program (Gabrhelik et al. 2012). The program has been designed for adolescents within the age of 12–14 years and has been also implemented in the following countries: Italy, Belgium, Spain, Austria, Sweden, Greece and Germany (Bohrn et al. 2008). The theoretical background of the Unplugged program lies in the CSI model (Comprehensive Social Influence model) and the KAB model (Knowledge – Abilities – Behavior). It is based on the combination of prevention methods that are focused on personal and social skills development and the corrections of normative beliefs regarding substance use.

The program is divided into 12 lessons, which include three content units: Information and Attitudes, Intrapersonal Skills, and Interpersonal Skills. During the program, students acquire social, emotional, and personality skills, critical-thinking skills, effective communication skills, decision-making skills, problem-solving skills, self-regulatory skills, and other interpersonal skills through development of group dynamics and social interaction (Miovský et al. 2012). Regarding the methodological material, the program contains a handbook for teachers, a workbook for students, and cards.

The Unplugged program was implemented by teachers who completed a three-day training course. The implementation did not follow a strict time plan but depended on the availability and resources of each school individually. The implementation took place in the primary schools in the Slovak Republic. The teachers' training course focused on the program implementation process, interactive work with pupils, and the methodology necessary to work with social competences.

3.2. Sample

The evaluation of Unplugged has been conducted within an experimental design as a repeated measure study with baseline (T1) and six month follow-up (T2).

School selection was conducted with the aim to obtain a representative sample with respect to regional, town size characteristics in order to meet the requirements of the project under which the Unplugged program had been implemented (for more information see Berinšterová et al. 2015).

In total, 12 primary schools participated in the study (six schools in the experimental group and six in the control group). The schools were randomly selected and assigned to either the experimental or the control group. Seventh-grade students from every school participated in the research. The study obtained the local university

Ethics committee approval. Parents were informed about the study and could opt out if they disagreed with their child's participation.

Within this current study, data from the baseline (T1) and the six month follow-up (T2) have been analyzed. Only participants who completed both questionnaires at T1 and at T2 had been included in the analysis. Ultimately, 425 early adolescents participated in the research (57% in the experimental group). The mean age at baseline was 13.50, SD 0.67 (min 13 – max 16); 48% males. As the participation in the research was anonymous, an identification code was used to pair respondents across the waves. Due to some errors in the identification code as well as the absence due to sickness of some respondents, a total number of 21.6% of respondents could not be paired.

The experimental group and the control group were compared and no difference in alcohol use and cigarette smoking in the previous 30 days was found between paired respondents and unpaired respondents in both groups. We also checked the differences in the background characteristics, such as gender for both groups, and found no differences. The Mann-Whitney U test was used to check for differences in all independent variables between paired and unpaired respondents, and differences were found only in the experimental group in the variables of Home meaningful participation and School meaningful participation, which were higher among the unpaired respondents.

3.3. Measures

Change in cumulative index of substance use was created by computing two variables that represented alcohol use (e.g., 'On how many occasions (if any) have you had any alcoholic beverage to drink during the last 30 days?') and cigarette smoking (e.g., 'On how many occasions (if any) have you smoked cigarettes during the last 30 days?') with possible answers: 0, 1, 2 – 4, 5 or more. We dichotomized the variables separately at T1 and T2 into 'no alcohol use/no cigarette use = 0' (those who did not drink alcohol or smoke cigarettes in the past 30 days) versus 'present alcohol use/cigarette use = 1' (others). Dichotomized variables were computed separately at T1 and T2 into 'no risk behavior' = 0 (absence of alcohol use and cigarette smoking) and 'present risk behavior' = 1 (alcohol use or cigarette smoking) and the variable labeled 'cumulative index of risk behavior' was created. After creating a risk behavior cumulative index separately for T1 and T2, we generated the variable called 'change in prevalence of risk behavior cumulative index' representing the difference in risk behavior between T1 and T2. Four groups were created (0 = non users – no risk behavior at T1 and T2, 1 = persistent users – present risk behavior at T1 and T2, 2 = new users – no risk behavior at T1 but present risk behavior in T2, 3 = ex users – present risk behavior at T1 and but no risk behavior at T2).

Only 1.9% of adolescents in the control group and 4.0% in the experimental group at T1 exhibited a concurrent polydrug use in the previous 30 days. Due to the very low prevalence of risk behavior, it was not possible to conduct valid analyses. Thus, the subgroups: permanent users, new users, and ex users are generated based on either alcohol use or cigarette smoking at T1 and T2. The number of participants in every group can be found in *Table 1.*

Table 1
The number of participants according to change in cumulative index of substance use

Change in cumulative index of substance use	*Control group*	*Experimental group*	*Total*
Non-users	132 (65.7%)	183 (67.8%)	315 (66.9%)
Permanent users	18 (9.0%)	38 (14.1%)	56 (11.9%)
New users	28 (13.9%)	22 (8.1%)	50 (10.6%)
Ex users	23 (11.4%)	27 (10.0%)	50 (10.6%)

The RYDM (Resilience and Youth development module) (Constantine et al. 1999; Furlong et al. 2009) measures external resources as aspects of resilience with a four-point Likert type scale (from 1 = not at all true to 4 = very much true). A higher score represents a higher level of resilience. In the present study, we focus on the nine external resources that support development and resilience.

By answering 38 questions, the respondents expressed their own perception of three protective factors – supportive relationships, high expectations, and opportunities for meaningful participation across the environment where a young person moves: home, school, community and peer group. Hanson and Kim (2007) found that the items from the subscales caring relationship and high expectations form a single factor which they called 'Support'. This study focuses on the School Support (e.g., 'At my school, there is a teacher or some other adult who really cares about me'), School Meaningful Participation (e.g., 'At school I help decide things like class activities or rules'), Home Support (e.g., 'At my home there is a parent that cares about my school'), Home Meaningful Participation (e.g., 'At home I participate in decision making with my family'), Community Support (e.g., ' Outside of my home and school, there is an adult who really cares about me'), Community Meaningful Participation (e.g., 'Outside of my home and school, I do these things: I am part of clubs, sports teams, church/temple, or other group activities'), Peer Support (e.g., 'I have a friend about my own age who really cares about me'), Prosocial Peers (e.g., 'My friends try to do what is right') and School Connectedness (e.g., 'I feel

like I am part of this school'). Cronbach´s alpha was calculated for the whole scale (α = 0.92) as well as for the individual subscales (α = 0.87; α = 0.67; α = 0.85; α = 0.81; α = 0.93; α = 0.68; α = 0.90; α = 0.60; α = 0.81), yielding generally a very high consistency.

The Self-Esteem scale (Rosenberg 1979) consists of ten items (e.g., 'On the whole, I am satisfied with myself'). Respondents answer individual questions on a four-point Likert type scale (from 1 = strongly disagree to 4 = strongly agree). A higher score represents a higher level of self-esteem. The Cronbach´s alpha was 0.76.

The Self-control scale (Finkenauer et al. 2005) originally consisted of 11 items (e.g., 'I have a hard time breaking a bad habit'). Respondents answer on a five-point Likert type scale (from 1 = never to 5 = always). A higher score indicates a higher level of self-control after re-coding. The shortened version of the questionnaire was used due to the low level of internal consistency. Cronbach´s alpha of the shortened version was 0.66.

3.4. Statistical analyses

All data were analyzed using the statistical software package IBM SPSS Statistics, version 21 for Windows.

A T-test was performed to address gender differences in all independent variables. Before exploring the association, we checked the model fit. The variance inflation factor diagnostics found that multicollinearity among the predictors was not a concern. The linear relationship between predictors and the logit of the outcome variable was proofed as well as the independence of errors due to the dispersion parameter φ (Field 2009).

Then we assessed the association between internal assets and perceived external resources of resilience at T2 as possible factors influencing change in cumulative index of substance use by using multinominal logistic regression separately for internal assets and for the perceived external resources of resilience. In both regression models, the effect of gender and Unplugged participation was explored. As a reference category the 'non-users' were used.

4. Results

The descriptive characteristics of the independent variables (internal assets and perceived external resources of resilience) for the control and experimental group at T2 are presented in *Table 2*.

Table 2
Descriptive characteristics of the studied variables in T2

	Control group		*Experimental group*		*t/u*	*Cohen´s d*
	Mean	SD	Mean	SD		
Self-esteem	2.77	0.50	2.66	0.46	2.73*	0.22
Self-control	3.30	0.62	3.21	0.58	1.54	0.15
School Support	2.83	0.85	2.71	0.79	1.66	0.14
School Meaningful Participation	2.56	0.83	2.50	0.80	124555.00	0.07
Home Support	3.40	0.65	3.37	0.64	114911.00	0.04
Home Meaningful Participation	3.08	0.88	3.11	0.78	-0.37	-0.03
Community Support	2.84	1.03	2.92	0.96	-0.89	-0.08
Community Meaningful Participation	2.99	0.92	2.97	0.82	0.26	0.02
Peer Support	2.99	1.05	3.20	0.84	-2.37*	-0.22
Prosocial Peers	2.61	0.67	2.56	0.66	0.85	0.07
School connectedness	3.60	0.90	3.46	0.83	1.74	0.16

*p < .05, **p < .0.

Table 2 shows that T-test was used to explore the differences in independent variables at T2 based on the participation in Unplugged. *Home Support* and *School Meaningful Participation* were not normally distributed, and as a result, Mann-Whitney U test was used.

The analysis has shown that significant differences existed between the participants in the control and the experimental group in Self-esteem and Peer support. The mean score in self-esteem was statistically significantly higher in the control group, while peer support stood higher in the experimental group. However, the effect size (Cohen) showed low values.

4.1. Internal assets of resilience

Table 3
Change in cumulative index of substance use in association with internal assets, multinominal logistic regression in T2

		95% C.I. for EXP(B)	
	OR	*Lower*	*Upper*
	Permanent users		
T2 Self-esteem	**0.474***	0.243	0.925
T2 Self-control	0.705	0.450	1.105
Gender	**0.535***	0.295	0.971
Program Unplugged	1.364	0.736	2.528
	New users		
T2 Self-esteem	0.530	0.262	1.074
T2 Self-control	0.681	0.425	1.090
Gender	**0.521***	0.279	0.972
Program Unplugged	**0.513***	0.277	0.949
	Ex users		
T2 Self-esteem	0.513	0.256	1.028
T2 Self-control	0.879	0.553	1.396
Gender	0.625	0.338	1.157
Program Unplugged	0.773	0.420	1.423

Reference group: non-users, males, control group

$x^2 = 32.179$ (df = 12, $p < 0.001$)

*p < .05, **p < .01.

Two separate multinominal regression models were created to determine the association between the change in the cumulative index of substance use and (1) internal assets of resilience, and (2) the perceived external resources of resilience.

Table 3 shows the results of the multinominal regression analyses with internal assets of resilience including self-esteem and self-control, gender, and program Unplugged participation. Non-users served as the reference category to which the

three other groups were compared. The regression model was statistically significant $X^2 = 32.179$ (df = 12, $p < 0.001$), and explained between 6.6% (Cox & Snell R square) and 7.6% (Nagelkerke R squared) of variance in change in cumulative index of substance use.

Non-users vs. Permanent users: Relative to children in the non-user group, children in the permanent user group were more likely to have a lower self-esteem (OR 0.474; 95% CI 0.243 – 0.925). Regarding gender, being a female reduces the likelihood of being in the permanent user group (OR 0.535; 95% CI 0.295 – 0.971).

Non-users vs New users: Participation in Unplugged reduces the likelihood of being a new user (OR = 0.513; 95% CI 0.277 – 0.949). Regarding gender, being a female reduces the likelihood of being in the permanent user group (OR = 0.521; 95% CI 0.279 – 0.972).

Non-users vs Ex-users: No statistically significant differences were found.

4.2. External resources of resilience

Table 4
Cumulative index of substance use in association with external resources of resilience, multinominal logistic regression in T2

		95% C.I. for EXP(B)	
	OR	*Lower*	*Upper*
Permanent users			
T2 School Support	0.768	0.481	1.225
T2 School Meaningful Participation	1.244	0.778	1.989
T2 Home Support	**0.598**	0.358	0.999
T2 Home Meaningful Participation	0.896	0.558	1.439
T2 Community Support	1.398	0.957	2.041
T2 Community Meaningful Participation	0.950	0.633	1.426
T2 Peer support	1.223	0.829	1.803
T2 Prosocial Peers	**0.550**	0.329	0.919
T2 School connectedness	**0.567**	0.381	0.844
Gender	0.586	0.294	1.166
Program Unplugged	1.547	0.793	3.019

New users			
T2 School Support	0.787	0.478	1.295
T2 School Meaningful Participation	1.205	0.738	1.970
T2 Home Support	0.887	0.497	1.584
T2 Home Meaningful Participation	1.060	0.640	1.757
T2 Community Support	1.040	0.712	1.519
T2 Community Meaningful Participation	0.829	0.541	1.269
T2 Peer support	1.323	0.831	1.828
T2 Prosocial Peers	**0.370**	0.216	0.635
T1 School connectedness	0.741	0.476	1.153
Gender	0.623	0.303	1.280
Program Unplugged	0.586	0.300	1.142
Ex users			
T2 School Support	1.155	0.685	1.948
T2 School Meaningful Participation	0.595	0.350	1.012
T2 Home Support	0.915	0.509	1.645
T2 Home Meaningful Participation	0.964	0.587	1.585
T2 Community Support	0.838	0.598	1.175
T2 Community Meaningful Participation	1.223	0.791	1.892
T2 Peer support	1.224	0.822	1.822
T2 Prosocial Peers	0.931	0.538	1.609
T2 School connectedness	0.748	0.482	1.160
Gender	0.809	0.401	1.632
Program Unplugged	0.717	0.377	1.365

Reference group: non-users, males, control group

$x^2 = 76.550$ (df =33, $p < 0.001$)

*p < .05, **p < .01.

Table 4 shows the results of the second multinominal regression analysis with perceived external resources of resilience, gender, Unplugged participation and the dependent variable. Non-users served as the reference category to which the three other groups were compared. The regression model was statistically significant $X^2 = 76.550$ (df = 33, $p < 0.001$) and explained between 16.1% (Cox & Snell R square) and 18.6% (Nagelkerke R squared) of variance in change in cumulative index of substance use.

Non-users vs. Permanent users: Relative to adolescents in the non-users group, children in the permanent users group were more likely to have a lower level of home support (OR 0.598; 95% CI 0.358 – 0.999), school connectedness (OR 0.567; 95% CI 0.381 – 0.844) and prosocial peers (OR 0.550; 95% CI 0.329 – 0.844).

Non-users vs New users: Relative to children in the non-user group, children in the new users group were more likely to have a lower level of prosocial peers (OR 0.370; 95% CI 0.216 – 0.635).

Non-users vs Ex-users: No statistically significant differences were found.

5. Discussion

This study's principal goal was to examine the role of the internal assets and perceived external resources of resilience in explaining persistent healthy behavior among early adolescents represented by change in cumulative index of risk behavior, and to explore whether gender and participation in Unplugged contributed to it.

Using multinominal logistic regression, we examined two internal assets of resilience associated with substance use among early adolescents: self-esteem and self-control at T2. Higher self-esteem was significantly associated with higher probability of being a non-user early adolescent. Our results are in accordance with the research showing that self-esteem is a key determinant of substance use but also of other antisocial behavior. A recent study has confirmed that if adolescents with higher self-esteem used alcohol, cigarettes, or marihuana, it was much lower when compared to adolescents with lower self-esteem (Zamboanga et al. 2009). The data from BASUS (British Columbia Adolescents Substance Use Surveys) discovered that an increase of a point in Rosenberg Self-Esteem Scale reduced the odds of initiation alcohol use by 3%, tobacco use by 9% and marihuana use by 7% among 8 and 9 grade students (Richardson et al. 2013). However, our results do not confirm previous findings regarding self-control as protective factors regarding substance use (Moffitt et al. 2011; Griffin & Botvin 2010) but these studies have mostly examined internal assets separately. As we conducted research where we examined two independent and strong internal assets simultaneously within the program Unplugged, we assumed that this could be the reason behind our results. Moreover, early adolescence is a period of significant social pressure and thus

self-control itself may not play such a significant role in substance use compared to self-esteem.

Then, we examined the nine perceived external resources of resilience. The result showed that adolescents with higher home support, prosocial peers and school connectedness were more likely to be non-users than permanent users with the strongest effect seen in the resource prosocial peers. In addition, the higher level of prosocial peers had a protective effect on becoming a new user as well.

School connectedness is an essential protective environmental factor for substance use as well as other kinds of different risk behavior (Weatherson et al. 2018). The importance behind the school connectedness is that connection to a school gives young adolescents a feeling that they belong to their school, and that their teachers and peers care about them and their learning process (Centers for Disease Control and Prevention 2009). Nowadays, children spend more time in school with their teachers and their peers than they spend with their parents due to overload and work pressure. We assume that feeling accepted and cared about in the environment in which they spend a great amount of time is becoming more and more important in young people's lives, enhancing their resilience and protecting them against substance use. To some extent, school connectedness may serve as a social control that reduces risk behavior or prevents it (Catalano et al. 2004).

As mentioned in the introduction, the key protective role of home environments lies in early childhood when intrapersonal and interpersonal skills develop and create a primary shield against risk behavior. As the children get older, the importance shifts away from their home environment and this process culminates in adolescence. Attachment and influence moves from parents to peers as a separation process emerges, and peers become the resource of free time activity and comfort (Noller et al. 2000). Our results support this theory, showing that both higher perceived home support and higher perceived prosocial peers play a key role in those interviewed becoming non-users rather than permanent users. Home support still plays a role as a protective factor but not exclusively. We could hypothesize that in early adolescence, the shift from home attachment to peer attachment begins but their complementary role has a greater protective effect than when taken individually. The significance of peer importance in our results is obvious. The lower the level of perceived prosocial peers, the higher probability of not only becoming permanent users but also a new user. It is known that adolescents tend to pick friends with similar attitudes, values, and background (Von Tetzchner 2018), and therefore it may be possible that the protective effect of their home environment manifests its protective role through the friends with whom the child chooses to associate with.

Our results have indicated that community environment is not associated with substance use among young adolescents. Community environment can be seen as a protective factor among collectivistic cultures to a greater extent when compared to individualistic cultures. Research in specific demographic groups where substance

use tends to be high, such as American Indian and Alaska Natives (Radin et al. 2015), supports this idea and focuses the attention to community resilience. In short, we could imply that a risky environment contributes to early adolescents' substance use whereas a safe environment is not an eminent protective factor against the early onset of substance use.

In our study, we also investigated the role of gender and program participation regarding substance use among early adolescence. A direct effect of the program participation on substance use was found, particularly participation in Unplugged: it lowered the chances of being a new user compared to our control group, which suggests that Unplugged has a protective effect against the early onset of substance use. These results are in accordance with the main goal of primary prevention programs (Cuijpers 2003) and also in accordance with the goal of Unplugged – not to just reduce substance use but also to delay its onset to later years where young people would be more mature to handle the situation correctly. In this study, being a female increases the probability of being a non-user adolescent when compared to males. This result supports a previous finding that males tend to engage in risk behavior at an earlier age than females (Alvanzo et al. 2011). However, in recent years, more research has suggested that although gender differences are present during the early adolescence, among 13 and 15-year-old adolescents, the differences are ceasing to exist (WHO 2016).

To conclude, our research generally confirms the resilience theory by showing that the combination of various internal and perceived external resilience factors (i.e., self-esteem, school connectedness, home support, prosocial peers) emerging from the social areas and relationships, play an important role in maintaining healthy behavior and provide protection from engaging in alcohol use or cigarette smoking in early adolescence. However, school psychologists and educators remain limited in their opportunities to intervene and secure, for example, efficient home support or community environment in order to promote resilience. On the other hand, they may be very efficient in the school context. It seems that school carries an opportunity to promote resilience by creating an environment where students feel connected and have prosocial peers. Van Uden (2014) asked schoolchildren what it is that teachers do to help them build resilience, and two aspects of teachers' behavior were identified: (1) helpful, friendly and firm behavior, (2) authoritative management. Johnson (2008) has also emphasized the daily interaction between student and teacher. It was the 'little things' which make students engaged, persistent, and gives them the feeling of self-worth such as a student being listened to, providing help with schoolwork, behaving respectfully, and maintaining hope and encouragement regarding student learning. Moreover, schools provide a place for school-based prevention programs such as Unplugged, of which the effectiveness in preventing engagement in risk behavior has been shown. Therefore, we recommend participation in the evidence-based school-centered intervention programs.

It is important to acknowledge the limitations of this study. Early adolescents are a specific group for investigation, characterized by developmental changes, therefore any generalization from this study should be done with care. Secondly, the time period in which we collected our data was relatively short. We have addressed the changes only within six months. It would be beneficial to study the predictive power over a longer period of adolescent years. Future studies should also focus on other internal assets linked to substance use such as self-efficacy, optimism, coping, etc. Lastly, to assess substance use, internal assets and perceived external resources of resilience can be limited to some extent due to reliance on the self-reporting of early adolescents, knowing only their perception of their environment, and their internal assets.

6. Conclusion

In summary, this study reports on the importance of internal assets and external resources of resilience, the program Unplugged and gender regarding absence of alcohol or cigarette use in early age. We have found that early adolescents who have higher levels of self-esteem, perceived home support, school connectedness, prosocial peers and are female, were more likely not to use any alcohol and cigarettes in the previous 30 days within a six month period. Early adolescents with higher levels of prosocial peers were also less likely to become new users. Participation in the school-based universal prevention program Unplugged had a potential for delaying an early onset of substance use – the probability of becoming a new user was higher in the control group than in the experimental group. Despite these limitations, this study provides a unique contribution to the growing theoretical and practical knowledge regarding resilience, prevention programs, and substance use in early adolescence.

References

Alesina, M., F. Vigna-Taglianti, G.Cuomo, S. Talić & M. Košir (2014, October 22–24) *Evaluation of Effectiveness of Unplugged in Slovenia: a Non-Randomized Controlled Trial* [Conference presentation], European Society for Prevention Research 6th Conference, Ljubljana, Slovenia, retrieved 18 Sep from https://www.eudap.net/PDF/201510c_EUSPR_Unplugged%20effectiveness%20in%20Slovenia.pdf.

Alvanzo, A.A.H., C.L. Storr, L. La flair, K.M. Green, F.A. Wagner & R.M. Crum (2011) 'Race/Ethnicity and Sex Differences in Progression from Drinking Initiation to the Development of Alcohol Dependence', *Drug and Alcohol Dependence* 118(2–3), 375–82 (https://doi.org/10.1016/j.drugalcdep.2011.04.024).

Benard, B. (2004) *Resiliency: What We Have Learned* (San Francisco: WestEd).

Benard, B. & S. Slade (2009) 'Listening to Students: Moving from Resilience Research to Youth Development Practice and School Connectedness' in M.J. Furlong, R.Gilman & E. S.Heubner, eds., *Handbook of Positive Psychology in Schools*, 353–69 (New York: Routledge) retrieved 14 Sep 2021 from https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.404.4872&rep=rep1&type=pdf.

Berinšterová, M., A. Janovská, B. Gajdošová, O. Kalina & M. Bačíková (2015) *Health-Related Behavior among Schoolchildren: Unplugged–Drug Use Prevention Program in Slovakia* (Košice: Univerzita Pavla Jozefa Šafária v Košiciach) retrieved 14 Sep 2021 from https://www.upjs.sk/public/media/13643/Health-related%20behavior%20among%20schoolchildren.pdf.

Bohrn, K., L. Fabiani, E. Florek, R. Gabrhelik, R. Galanti, M. Kyriakidou, S. Sanchez, G. Terzopoulou, S. Vadrucci, M. Vassara & F. V. Taglianti (2008) 'Preventing Substance Abuse among Students: A Guide to Successful Implementation of Comprehensive Social Influence (CSI) Curricula in Schools' in *European Drug Addiction Prevention Trial,* retrieved 18 Sep 2021 from https://www.eudap.net/Unplugged_HomePage.aspx.

Bronfenbrenner, U. (1979) *The Ecology of Human Development: Experiments by Nature and Design* (Cambridge, USA: Harvard).

Cadima, J., M. Enrico, T. Ferreira, K. Verschueren, T. Leal & P.M Matos (2016) 'Self-Regulation in Early Childhood: The Interplay Between Family Risk, Temperament and Teacher–Child Interactions', *European Journal of Developmental Psychology* 13(3), 341–60 (https://doi.org/10.1080/17405629.2016.1161506).

Castellanos-Ryan, N., M. O'leary-Barrett & P.J. Conrod (2013) 'Substance-Use in Childhood and Adolescence: A Brief Overview of Developmental Processes and Their Clinical Implications', *Journal of the Canadian Academy of Child and Adolescent Psychiatry* 22(1), 41–46.

Catalano, R.F., S. Oesterle, C.B. Fleming & J.D. Hawkins (2004) 'The Importance of Bonding to School for Healthy Development: Findings from the Social Development Research Group', *Journal of School Health* 74(7), 252–61 (http://doi.org/10.1111/j.1746-1561.2004.tb08281.x).

Centers For Disease Control And Prevention (2009) *School Connectedness: Strategies for Increasing Protective Factors Among Youth* (Atlanta: US Department of Health and Human Services) retrieved 15 Aug 2020 from https://www.cdc.gov/healthyyouth/protective/pdf/connectedness.pdf.

Constantine, N., B. Benard & M. Diaz (1999) *Measuring Protective Factors and Resilience Traits in Youth: The Healthy Kids Resilience Assessment*, Paper presented at the Seventh Annual Meeting of the Society for Prevention Research, New Orleans, LA.

Cuijpers, P. (2003) 'Three Decades of Drug Prevention Research', *Drugs: Education, Prevention and Policy* 10(1), 7–20 (https://doi.org/10.1080/0968763021000018900).

Diclemente, R.J., W.B. Hansen & L.E. Ponton, eds. (2013) Handbook of Adolescent Health Risk Behavior (Berlin: Springer).

Donnelly, J., M. Young, R. Pearson, T.M. Penhollow & A. Hernandez (2008) 'Area Specific Self-Esteem, Values, and Adolescent Substance Use', *Journal of Drug Education* 38(4), 389–403 (http://doi.org/10.2190/DE.38.4.f).

ESPAD Group (2016) *ESPAD Report 2015: Results from the European School Survey Project on Alcohol and Other Drugs* (Luxembourg: Publications Office of the European Union) retrieved 15 Sep 2021 from https://www.emcdda.europa.eu/system/files/publications/3074/ESPAD_report_2015.pdf.

Faggiano, F., F. Vigna-Taglianti, G. Burkhart, K. Bohrn, L. Cuomo, D. Gregori, M. Panella, M. Scatigna, R. Siliquini, L. Varona, P. Van der Kreeft, M. Vassara, G. Wiborg, M.R. Galanti & the EU-Dap Study Group (2010) 'The Effectiveness of a School-Based Substance Abuse Prevention Program: 18-Month Follow-Up of the EU-Dap Cluster Randomized Controlled Trial', *Drug and Alcohol Dependence* 108(1–2), 56–64 (http://doi.org/10.1016/j.drugalcdep.2009.11.018).

Fergus, S. & M.A Zimmerman (2005) 'Adolescent Resilience: A Framework for Understanding Healthy Development in the Face of Risk', *Annual Review of Public Health* 26, 399–419 (http://doi.org/10.1146/annurev.publhealth.26.021304.144357).

Field, A. (2009) *Discopering Statistics Using SPSS* (3rd ed., Thousand Oaks: SAGE).

Finkenauer, C., R.C.M. Engels & R.F. Baumeister (2005) 'Parenting Behaviour and Adolescent Behavioural and Emotional Problems: The Role of Self-Control', *International Journal of Behavioral Development* 29(1), 58–69 (https://doi.org/10.1080/01650250444000333).

Furlong, M. J., K.M. Ritchey & L.M. O'brennan (2009) 'Developing Norms for the California Resilience Youth Development Module: Internal Assets and School Resources Subscales', *The California School Psychologist* 14, 35–46 (https://doi.org/10.1007/BF03340949).

Gabrhelik, R., A.Duncan, M.H. Lee, L. Stastna, C.D.M. Furr-Holden & M. Miovsky (2012) 'Sex Specific Trajectories in Cigarette Smoking Behaviors among Students Participating in the Unplugged School-Based Randomized Control Trial For Substance Use Prevention', *Addictive Behaviors* 37(10), 1145–50 (http://doi.org/10.1016/j.addbeh.2012.05.023).

Gaertner, A.E., P.J. Fite & C.R. Colder (2010) 'Parenting and Friendship Quality as Predictors of Internalizing and Externalizing Symptoms in Early Adolescence', *Journal of Child and Family Studies* 19, 101–108 (https://doi.org/10.1007/s10826-009-9289-3).

Griffin, K.W. & G.J. Botvin (2010) 'Evidence-Based Interventions for Preventing Substance Use Disorders in Adolescents', *Child and Adolescent Psychiatric Clinics of North America* 19(3), 505–26 (http://doi.org/10.1016/j.chc.2010.03.005).

Hanson, T.L. & J.O. Kim (2007) 'Measuring Resilience and Youth Development: The Psychometric Properties of the Healthy Kids Survey', *Issues & Answers Report REL* 2007, 34 (Washington: National Center for Education Evaluation and Regional Assistance) retrieved 15 Sep 2021 from https://ies.ed.gov/ncee/edlabs/regions/west/pdf/REL_2007034.pdf.

Hodder, R.K., M. Freund, J. Bowman, L. Wolfenden, K. Gillham, J. Dray & J. Wiggers (2016) 'Association Between Adolescent Tobacco, Alcohol and Illicit Drug Use and Individual and Environmental Resilience Protective Factors', *BMJ Open* 6(11) e012688 (http://doi.org/10.1136/bmjopen-2016-012688).

Institute of Medicine (US) and National Research Council (US) Committee on the Science of Adolescence (2011) *The Science of Adolescent Risk-Taking: Workshop Report* (Washington: The National Academies) retrieved 15 Sep 2021 from https://www.ncbi.nlm.nih.gov/books/NBK53418/.

Johnson, B. (2008) 'Teacher–Student Relationships which Promote Resilience at School: A Micro-Level Analysis of Students' Views', *British Journal of Guidance & Counselling* 36(4), 385–98 (https://doi.org/10.1080/03069880802364528).

King, K.M. & L. Chassin (2007) 'A Prospective Study of the Effects of Age of Initiation of Alcohol and Drug Use on Young Adult Substance Dependence', *Journal of Studies on Alcohol and Drugs* 68(2), 256–65 (http://doi.org/10.15288/jsad.2007.68.256).

Kokkevi, A., E. Kanavou, C. Richardson, A. Fotiou, S. Papadopoulou, K. Monshouwer, J. Matias & D. Olszewski (2014) 'Polydrug Use by European Adolescents in the Context of Other Problem Behaviours', *Nordic Studies on Alcohol and Drugs* 31(4), 323–42 (https://doi.org/10.2478/nsad-2014-0026).

Kung, E.M. & A.D. Farrell (2000) 'The Role of Parents and Peers in Early Adolescent Substance Use: An Examination of Mediating and Moderating Effects', *Journal of Child and Family Studies* 9, 509–28 (https://doi.org/10.1023/A:1009427010950).

Lipperman-Kreda, S., P.J. Gruenewald, J.W. Grube. & M. Bersamin (2017) 'Adolescents, Alcohol, and Marijuana: Context Characteristics and Problems Associated with Simultaneous Use', *Drug and Alcohol Dependence* 179, 55–60 (http://doi.org/10.1016/j.drugalcdep.2017.06.023).

Luthar, S.S., D. Cicchetti & B. Becker (2000) 'The Construct of Resilience: A Critical Evaluation and Guidelines for Future Work', *Child Development* 71(3), 543–62 (https://doi.org/10.1111/1467-8624.00164).

Masten, A.S. (2007) 'Resilience in Developing Systems: Progress and Promise as the Fourth Wave Rises', *Development and Psychopathology* 19(3), 921–30 (http://doi.org/10.1017/S0954579407000442).

Masten, A.S. (2014) 'Global Perspectives on Resilience in Children and Youth', *Child Development* 85(1), 6–20 (http://doi.org/10.1111/cdev.12205).

Miovský, M., P. Novak, L. Stastna, R. Gabrhelik, L. Jurystova & J. Vopravil (2012) 'The Effect of the School-Based Unplugged Preventive Intervention on Tobacco Use in the Czech Republic', *Adicciones* 24(3), 211–17.

Moffitt, T.E., L. Arseneault, D. Belsky, N. Dickson, R.J. Hancox, H. Harrington, R. Houts, R. Poulton, B.W. Roberts, S.Ross, M.R. Sears, W.M. Thomson & A. Caspi (2011) 'A Gradient of Childhood Self-Control Predicts Health, Wealth, and Public Safety', *Proceedings of the National Academy of Sciences* 108(7), 2693–98 (http://doi.org/10.1073/pnas.1010076108).

Noller, P., J. Feeney, C. Peterson (2000) *Personal Relationships Across the Lifespan* (1st ed., New York: Routledge).

Nowak, M., M. Papiernik, A. Mikulska & B. Czarkowska-Paczek (2018) 'Smoking, Alcohol Consumption, and Illicit Substances Use Among Adolescents in Poland', *Substance Abuse Treatment, Prevention, and Policy* 13, 42 (https://doi.org/10.1186/s13011-018-0179-9).

Osgood, D.W., J.K. Wilson, P.M. O'malley, J.G. Bachman & L.D. Johnston (1996) 'Routine Activities and Individual Deviant Behavior', *American Sociological Review* 61(4), 635– 55 (https://doi.org/10.2307/2096397).

Poudel, A. & Gautam, S. (2017) 'Age of Onset of Substance Use and Psychosocial Problems Among Individuals with Substance Use Disorders', *BMC Psychiatry* 17, 10 (https://doi.org/10.1186/s12888-016-1191-0).

Radin, S.M., S.H. Kutz, J. La Marr, D. Vendiola, M. Vendiola, B. Wilbur, L.R. Thomas & D.M. Donovan (2015) 'Community Perspectives on Drug/Alcohol Use, Concerns, Needs, and Resources in Four Washington State Tribal Communities', *Journal of Ethnicity in Substance Abuse* 14(1), 29–58 (https://doi.org/10.1080/15332640.2014.947459).

Richardson, C.G., J.Y. Kwon & P.A. Ratner (2013) 'Self-Esteem and the Initiation of Substance Use Among Adolescent', *Canadian Journal of Public Health* 104, e60 – e63 (https://doi.org/10.1007/BF03405656).

Rosenberg, M. (1979) *Conceiving the Self* (New York: Basic Books).

Rudzinski, K., P. Mcdonough, R. Gartner & C. Strike (2017) 'Is There Room for Resilience? A Scoping Review and Critique of Substance Use Literature and its Utilization of the Concept of Resilience', *Substance Abuse Treatment, Prevention, and Policy* 12, 41 (https://doi.org/10.1186/s13011-017-0125-2).

Sanchez, Z.M., A. Sanudo, S. Andreoni, D. Schneider, A.P.D. Pereira & F. Faggiano (2016) 'Efficacy Evaluation of the School Program Unplugged for Drug Use Prevention Among Brazilian Adolescents', *Bmc Public Health* 16, 1206 (http://doi.org/10.1186/s12889-016-3877-0).

Ungar, M. (2004) *Nurturing Hidden Resilience in Troubled Youth* (Toronto: University of Toronto).

van Breda, A.D. (2018) 'A Critical Review of Resilience Theory and its Relevance for Social Work', *Social Work* 54(1), 1–18 (https://doi.org/10.15270/54-1-611).

van Uden, J.M., H. Ritzen & J. M. Pieters (2014) 'Engaging Students: The Role of Teacher Beliefs and Interpersonal Teacher Behavior in Fostering Student Engagement in Vocational Education', *Teaching and Teacher Education* 37, 21–32 (http://doi.org/10.1016/j.tate.2013.08.005).

von Tetzchner, S. (2018) *Child and Adolescent Psychology: Typical and Atypical Development* (London: Routledge).

Weatherson, K.A., M. O'neill, E.Y. Lau, W. Qian, S.T. Leatherdale & G.E. Faulkner (2018) 'The Protective Effects of School Connectedness on Substance Use and Physical Activity', *Journal of Adolescent Health* 63(6), 724–31 (http://doi.org/10.1016/j.jadohealth.2018.07.002).

Wills, T.A., M.G. Ainette, M. Stoolmiller, F.X. Gibbons & O. Shinar (2008) 'Good Self-Control as a Buffering Agent for Adolescent Substance Use: An Investigation in Early Adolescence with Time-Varying Covariates', *Psychology of Addictive Behaviors* 22(4), 459–71 (https://doi.org/10.1037/a0012965).

World Health Organization (2013) *Enforcing Bans on Tobacco Advertising, Promotion and Sponsorship: WHO Report on the Global Tobacco Epidemic* (Geneva: WHO) retrieved 15 Sep 2021 from https://apps.who.int/iris/bitstream/handle/10665/85380/9789241505871_eng.pdf;jsessionid=4AB5FBAEB9E2B-B1005AA70A10850B8F8?sequence=1.

World Health Organization (2016) 'Growing Up Unequal: Gender and Socioeconomic Differences in Young People's Health and Well-Being', *Healthy Policy for Children and Adolescents,* No.7 (Geneva: WHO) retrieved 15 Sep 2021 from https://www.euro.who.int/__data/assets/pdf_file/0003/303438/HSBC-No.7-Growing-up-unequal-Full-Report.pdf.

Zamboanga, B.L., S.J. Schwartz, L.H. Jarvis & K. Van Tyne (2009) 'Acculturation and Substance Use Among Hispanic Early Adolescents: Investigating the Mediating Roles of Acculturative Stress and Self-Esteem', *The Journal of Primary Prevention* 30, 315–33 (https://doi.org/10.1007/s10935-009-0182-z).

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RESILIENCE INTERVENTION TO STRENGTHEN SELF-REGULATION IN ADOLESCENT STUDENTS WITH HEARING LOSS**

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Background: The importance of strong self-regulation (SR) abilities for academic and social success is known, yet relatively few studies examine students' SR and how it can be promoted especially in adolescents with special needs, such as those students with hearing loss. The purpose of this study was to determine whether a resilience intervention program enhances SR in adolescents with hearing loss.
Methods: This study was experimental with a pre-test, post-test, follow up and control group design. Participants included 122 students with hearing loss in mainstream settings randomly assigned to intervention and control groups (61 students in each group). The interventional group had training for six weeks (two times per week for 75 min). The Adolescent Self-Regulatory Inventory was used to measure the self-regulation of students.
Results: The results indicated a significant difference between the control and interventional groups in SR, short SR, and Long SR after the intervention, at both the 6-week and 14-week measurements ($p < 0.001$).
Conclusion: This study's findings indicate that implementing resilience intervention programs can promote the self-regulation skills in adolescent students with hearing loss.

Key words: resilience; self-regulation; hearing loss; adolescents

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** The ethics committee of the University of Social Welfare and Rehabilitation Sciences approved the study (Ethical approval number: IR.USWR.REC. 1396.212).

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1. Introduction

Hearing loss is a widespread condition, affecting 32 million (9%) of the world's children and 360 million adults (5.3%) (World Health Organization 2012). A systematic review on otologic and non-otologic hearing impairment in school-aged children and adolescents reported the prevalence between 0.88% and 46.70% (Nunes et al. 2019). The prevalence of unilateral hearing loss in US adolescents aged 12–19 increased from 14.9% in 1988–1994 to 19.5% in 2005–2006. The families below poverty levels are more likely to have a family member with hearing loss 23.6% more than those above the threshold 18.4% (Shargorodsky et al. 2010). A number of studies reported a range of mental health, social, and communication problems in children and adolescents with hearing loss (Brown & Cornes 2015; Stevenson et al. 2015; Stevenson et al. 2017: Fellinger et al. 2012; McCarthy-Jones & Fernyhough 2011; Knutson & Lansing 1990). Inadequate communication strategies and poor accommodations in individuals with hearing loss are associated with some psychological problems (Knutson & Lansing 1990). An increased level of mental health problems (social, emotional, and mental well-being) were reported by adolescent students with hearing loss who were studying in a range of educational settings, and who had varying degrees of hearing impairments, and who used a range of communication modes. The analysis showed that the language used at home was a significant predictor of mental health problems (Brown & Cornes 2015). A meta-analysis study showed that children and adolescents with hearing loss experience more emotional and behavioral difficulties than their normal-hearing peers (Stevenson et al. 2017), and in teenagers, poor receptive language ability can lead to elevated emotional behavioral disorders (Stevenson et al. 2017).

Language serves as a self-regulatory function by guiding goal-directed behavior to facilitate problem solving (Vygotsky 1962). The use of self-directed speech which was mentioned by Vygotsky means to guide one's behavior doing difficult tasks. Language ability is important for the development of problem solving and regulatory skills. Children with better language skills can use inner speech as a self-guiding tool and show earlier internalization of private speech and regulatory mechanisms, resulting in better self-regulation and adjustment (Vallotton & Ayoub 2011). Individuals with hearing loss use the inner speech but may imply receiving less feedback from their surroundings due to the lack of auditory input. Inner conversations might compensate for this lack and assist self-reinforcement. Thus, a need for self-encouragement in the face of mostly ignorant surroundings seems necessary. For the person with hearing loss, an inner dialogue, employed in a positive and supportive way might be more important (Zimmermann & Brugger 2013). Speech skills and vocabulary impact social inclusion (Constantinescu et al. 2015), and for children with hearing loss,

this condition results in more limited opportunities for effective and satisfying interaction (Moores 2001; Quigley & Paul 1994). The experiences of students in inclusive settings indicate that during their attendance in these schools they bear a feeling of marginalization and isolation because they can not communicate easily with their peers (Angelides & Aravi 2007).

In North America, about 60–80% of students with hearing loss attend inclusive schools alongside normal-hearing pupils (Tye-Murray et al. 2014; Borders et al. 2010). Children and adolescents with hearing loss as well as their parents and teachers believe that in a successful inclusion of learners with hearing impairments, it is important to consider some factors that are: child-related, family involvement and use of technology (for example, use of hearing assistive devices for auditory stimulation), focusing on inclusion and specifically school and educational factors (teacher training and preparedness, school settings, instructional strategies and classroom management for student engagement). The significance of other factors such as communicating with specialists (specially getting information from medical professionals about cochlear implants and using assistive technologies) and the assessment of support technology, which relates to the assessment of resources such as visual supports, digital boards, and representations with images (Rosa & Angulo 2019; Collair 2001; Eriks-Brophy et al. 2006) is highlighted too. One of the goals in inclusive education is to facilitate academic and social success for students with hearing loss. A good inclusive classroom should facilitate cooperative learning, endorse participation and collaboration, encourage the expression of thoughts and behaviors, promote self-regulation (SR), and foster the development of social and emotional skills (Martin et al. 2017; Rimm-Kaufman et al. 2006; Rimm-Kaufman & Chiu 2007).

Self-regulation is defined as an ability to activate, monitor, and inhibit behavior, attention, emotions, or cognitive processes, also responding to internal or external stimuli in a flexible and adjustable way to achieve the desired outcomes (Demetriou 2000; Moilanen 2007). High levels of self-regulation are linked to prosocial behavior and academic achievement; prosocial adolescents are more likely to have greater self-efficacy in regulating risky behavior, managing negative emotions, and expressing positive emotions (Bandura et al. 2003). Moilanen and colleagues (2009, as cited in Dias et al. 2014) believe in evaluating the regulation of objectives in the most immediate or short-term, which could be functionalized as the control of attention, control of impulses, and emotional control or regulation of the immediate context. However, attention to long-term components of self-regulation is important too (Moilanen 2007). The long-term self-regulation considers a component of SR such as impulse control for a period of time: several weeks, months, or years (for example, when an adolescent takes a course to achieve career goals, or keeps saving money to buy an expensive object). This aspect of SR has been addressed in studies about school performance (Bilde et al. 2011;

Miller & Brickman 2004) or health behaviors (Hall & Fong 2007; Zimbardo & Boyd 1999).

The adolescence phase is a period when individuals experience peer, family, academic, and career stress as well as other individual challenges (Zimmer-Gembeck & Skinner 2008). The effects of stress on coping and psychological functioning are important because recurrent stressors may tax an adolescent's self-regulatory skills. Difficulties with self-regulation in adolescents showcases the emergence of a range of developmental outcomes, such as internalizing and externalizing problems, alcohol and substance use problems, low empathy, and issues with social and academic competence (Eisenberg et al. 2003; Krueger et al. 2002; Mischel et al. 1988). The study of King and colleagues (2013) indicated that the individual's development of effortful control (executive attention regulation and inhibitory control) and impulsivity (speed of response initiation) which are the core aspects of self-regulation (Rothbar et al. 2001) in childhood, is linked to differential outcomes in adolescents. Lower impulsivity and higher levels of effortful control are related to a decline in externalizing and internalizing problems and a higher social competence, as well as well-being. The individual variability in the development of impulsivity is unrelated to behavior problems, competence, and well-being, which means changes during other developmental periods may be more critical than in the pre-adolescent period. However, the changes over time across effortful control determine the variation in adjustment over and above the effects of earlier individual differences. Development of self-regulation is the key for successful adaptation in childhood and adolescence. Adaptation depends on managing emotions, regulating and directing behaviors, thinking constructively, and acting on the environment to change or decrease the sources of stress (Compas et al. 2001; Zimmer-Gembeck & Skinner 2011). Therefore, adolescents' self-regulatory abilities play an important role in this phase in terms of their functioning, resilience, and overall well-being (Elliot et al. 2011; Gardner et al. 2008; Hofer et al. 2011).

Resilience refers to a dynamic process wherein individuals show positive adaptation despite experiences of significant adversity (Luthar et al. 2000; Masten 1999). The effect of risk and protective factors on resilience has been studied. Risk factors are all stressful life events that may increase the onset of a problem or maintain the problem (Rutter 1985). Protective factors work as a dynamic mechanism that helps children to resist or balance the risks which they are facing (Rutter 1985; 2012). High intelligence, development of appropriate coping strategies, optimism, problem-solving, self-regulation are factors which act to protect individuals against adverse situations (Garcia-Vesga & Domíngues De La Ossa 2013; Zolkoski & Bullock 2012).

Students with hearing loss may be at risk for poor self-regulation compared to their normal-hearing peers. The development of SR requires effective communication through social interactions with others (Bodrova & Leong 2008; Zimmerman

1995). Therefore, the language and communication delays in children with hearing loss may contribute to a deficit in SR. They have more emotional and behavioral difficulties than their normal-hearing peers (Kirman & Sari 2013; Coll et al. 2009; Dammeyer 2009; Vostanis et al. 2007) and are rated as more impulsive and with lower inhibitory control (Greenberg & Kusché 1998). Self-regulation is closely related to emotional competency, which has an important role in social and academic success (Denham 2006; Sawyer et al. 2014). Children with hearing loss experience difficulties with their competency (Hatamizadeh et al. 2008), and since children use the skills of emotional competence to regulate their emotions, these youngsters experience problems with emotional regulation that is a core component of self-regulation (Murray et al. 2015).

There is much evidence that SR plays an important role in developing and maintaining physical health and well-being over one's lifespan (Bierman et al. 2008; Galla & Duckworth 2015; Moffitt et al. 2011). The ability to work toward a desired outcome while controlling whatever impulses that could arise seems to be an idea shared by differing definitions of self-regulation (Martin & McLellan 2008; Neal & Carey 2005). This can be relevant to resilience if managing personal challenges are accounted for in adjustments to life pathways (Buckner et al. 2009; Gestsdottir & Lerner 2008). A comprehensive review of self-regulation interventions from birth through young adulthood shows that positive and meaningful changes can result from several different intervention approaches, conflict resolution, stress management, coping, resiliency training, mind-body and mindfulness interventions (Murray et al. 2016). Some believe that language ability skills can serve as a predictor of self-regulation. SR is defined as a construct encompassing cognitive, physiological, emotional, and behavioral regulatory processes that promote adaptive or goal-directed behavior (Berger 2011; Calkins & Fox 2002). Interventions focusing on training the language and communication, social, and emotional skills can facilitate self-regulation in an individual. Considering the importance of SR skills, appropriate interventions seem necessary when children with hearing loss are likely to experience difficulties in managing their emotions and behaviors in stressful situations.

There are not many studies focusing on interventions for enhancing self-regulation in adolescents with hearing loss. Most studies in this area are focused on social and emotional interventions that in a way could promote self-regulation too (Bonillo 2017; Luckner & Sebald 2013; Luckner & Movahedazarhouligh 2019). Proper intervention can assist children in developing more adaptive and proceduralized strategies for self-regulation. This study adapted a resilience program (teaching social, emotional, positive self-talk, communication, problem solving, coping, and interpersonal skills) for children with hearing loss, and delivered it through explicit teaching. Also, since not much research exists that evaluated the effectiveness of resilience interventions in adolescents with hearing loss, this study's

aim was to determine the effect of a resilience intervention program that addresses the needs of adolescent students with hearing loss to learn and practice behavioral and cognitive skills designed to strengthen their self-regulation.

2. Method

This study was experimental with a pre-test, post-test, follow up and control group design.

2.1. Participants

The Education Ministry introduced 298 students (6th to 9th grades) with hearing loss studying in public inclusive schools for this study, in which 34 were not included because the schools, parents, or the students themselves did not agree to participate. Of the 264 who agreed to participate, 125 were randomly included in the study, three of which did not continue the program. They did not have any other disabilities (reported in their documents). The sample consisted of 74 boys and 48 girls. Without using hearing aids, the severity of hearing loss in 20 students was mild, in 85 it was moderate and in 17 it was in the moderate to severe range. By using hearing aids, the corrected hearing thresholds in the better ear of 83 students were within the mild, 24 in the moderate, and 15 in the moderate to severe range of hearing loss. The participants used hearing aids and some had cochlear implants. They used audio verbal communication. The cause of hearing loss for 106 students was congenital and for 16 was acquired. The participants were studying in public schools (there are two kinds of schools in which students with hearing loss could attend; public and private ones), and their socio-economic level was almost identical.

Informed parental and student consents were obtained and participants were assigned to experimental and control groups randomly across the schools. This is presented in *Figure 1.*

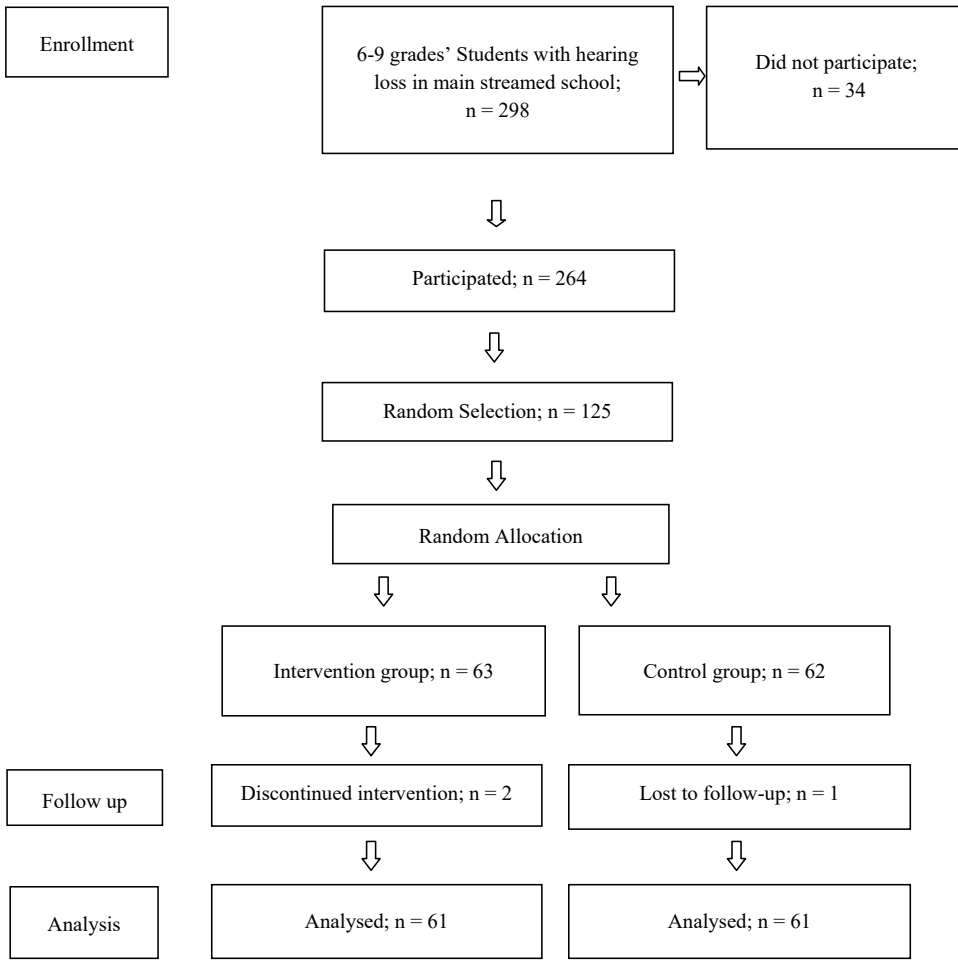

Figure 1
Flow diagram

2.2. Measures

The Self-regulation Scale: Adolescent Self-Regulatory Inventory (Moilanen 2007) contains 36 items which measure adolescents' ability to activate, monitor, maintain, inhibit, and adapt their emotions, thoughts, attention, and behavior. It assesses adolescent short-term self-regulation (dimension relates to impulse, attention and emotional regulation) toward immediate objectives, and long-term self-regulation

dimension (efforts to control impulse, attention, and emotional regulation) toward objectives that cover a longer period (as career goals, saving money, etc.). For measuring short-term self-regulation (Short SR), 13 items should be considered, for long-term self-regulation (Long SR) 14 items, and the remaining nine items are added to short and long self-regulation for measuring the overall self-regulation (SR). Rating of each item is based on the Likert type, ranging from 1 (not at all true for me) to 5 (really true for me). The reliability analyses for adolescent self-report on short and long-term self-regulation was reported: short-term; $\alpha = 0.75$ and long-term; $\alpha = 0.80$. In this study, $\alpha = 0.77$ was for self-regulation. The measurements for long and short-term self-regulation were $\alpha = 0.82$ and $\alpha = 0.73$.

A brief questionnaire that included demographic data on age, gender, grade, the severity of hearing loss and using hearing assistive devices, was used.

Pre-test measurements were administered just before the intervention, the post-tests were completed at the end of the intervention (six weeks later), and finally, the follow-up tests were completed (eight weeks after the post-test).

2.3. Intervention

The resilience intervention program was carried out by itinerant teachers and aimed at promoting the developmental integration of emotions, feelings, cognitive and behavioral skills. For the training, groups of 3–5 students were arranged based on school distances. The program was delivered in 12 sessions of 75 minutes each, twice a week for six weeks. The control group did not have the intervention during the program and attended the usual school curriculum. Considering the ethical issues, after finishing the program, the control group had the intervention in a shorter time. Both groups did not have any such intervention (psychological interventions) during and nine months previous to this program.

A review of resilience programs in the literature, such as the Penn Resiliency Program; (PRP) (Seligman et al. 2009), Resourceful Adolescent Program (RAP-A) (Shochet et al. 2004), Promoting Alternative Thinking Strategies (PATHS) (Greenberg & Kusché 1998) and the Aussie Optimism Resilience-focused Program (AORSP) (Gilmore et al. 2014), helped us to develop and adapt the program for hearing-loss students. To facilitate learning for students with hearing loss, lots of visual stimulation (pictures and drawings, pictured story books, role playing and games) were used in teaching the skills. The objectives of the lessons were mostly influenced by AORSP, since it is based on Seligman's theory of Positive Psychology and Penn Resiliency Program. AORSP was applied for students with intellectual disabilities and one of the professors in the study assisted us with this program.

The Penn Resiliency Program, which is the basis of this intervention program, validated skills that build cognitive and emotional fitness, strength of character, and strong relationships. Each skill targets one or more of the resilience competencies

(Murray et al. 2016). Some of the competencies are: self-awareness (the ability to pay attention to your thoughts, emotions, behavior, and physiological reactions), self-regulation (the ability to change one's thoughts, emotions, behavior, and physiology for a desired outcome), mental ability (the ability to look at situation from multiple perspectives and to think creatively and flexibly), strengths of character (the ability to use one's strengths to engage authentically, overcome challenges, and build a life aligned with one's values), connection and communication (the ability to build and maintain trusting relationships), problem solving (fight biases in thinking, accurately identify the causes of problem and find solutions), as well as optimism (the ability to understand and expect the positive to focus on what you can control, and take purposeful action). To achieve some of these competencies, the aim of this program was for the participants to understand and use the related skills appropriately in different situations. Thus, the subjects of the program's sessions were arranged for teaching about: feelings, styles of thinking (positive, negative) and the link between thoughts and feelings, coping strategies, strengths and weaknesses, problem-solving, communication skills, social skills, negotiation, despising and ridiculing, as well as intrapersonal and interpersonal skills. The intervention package contained two booklets; for the itinerant teacher (a special teacher for students with hearing loss) and for the student. The teacher's booklet consisted of 12 modules (each includes the aim and an introduction, the instruments she/he needs (for example student's booklet, black- or whiteboard, storybooks for some sessions, etc.), the time needed for each activity, the manual for teaching and doing activities with students, and a page of short information for parents to observe and possibly follow the thought skills and practices. The student's booklet included 12 modules with individual activities (such as answering the questions in the booklet, drawing, etc.) and group activities (discussing the subject or question that the teacher asks, playing games, role-playing, etc.). More description of the sessions is in a complementary file (Adibsereshki et al. 2019).

2.4. Data analysis

The Kolmogorov-Smirnov test was used to examine the normality of the SR scores' distribution (*Table 2*). Normally, distributed scores were analyzed with the t-test and non-normal ones with the Mann-Whitney test.

3. Results

The ages of the participants (122 students) ranged between 12 to 15. The mean and standard deviation was 13.65 ± 1.00 and the ratio for gender was 3/2 (74 boys and 48 girls). There was no significant difference between the groups in age and gender. Of all students, 78 (51.6%) used a hearing aid in one ear, 44 (36.1%) in both ears,

and 8 (6.6%) students used cochlear implants. Most of the participants, 83 (68%) were within the mild, and the rest, 24 (19.7%) in the moderate, while 15 (12.3%) were in the moderate severe range of hearing loss. The American Speech-language Hearing Association's (ASHA, 2015) classification was used for identifying the degree of hearing loss; normal (10–15), slight (16–25), mild (26–40), moderate (41–55), moderately severe (56–70), severe (71–90), and profound (91+).

Table 1 shows the mean scores of interventional and control groups in T1, T2, T3; before the intervention, after the intervention (six weeks after starting intervention) and follow-up (14 weeks after starting intervention). The mean score of the interventional group was increased from T = 98.74 ± 12.27 to T2 = 108.44 ± 8.21 and T3 = 107.93. Also, the mean scores of the interventional group in T2 and T3 were higher than in the control group.

Table 1
Mean scores in intervention and control groups

	Intervention			*Control*		
	Mean±SD			*Mean±SD*		
	T1	*T2*	*T3*	*T1*	*T2*	*T3*
SR	98.74 ± 12.27	108.44 ± 8.21	107.9 ± 7.84	97.69 ± 14.24	98.51 ± 14.36	98.06 ± 7.08
Short SR	35.08 ± 5.57	39.92 ± 4.15	39.57 ± 4.72	35.72 ± 7.15	36.36 ± 7.16	36.30 ± 4.17
Long SR	37.64 ± 7.81	43.60 ± 6.16	42.93 ± 4.72	39.95 ± 6.06	38.13 ± 6.09	38.08 ± 4.57

Table 2 displays a one-sample Kolmogorov-Smirnov test for normality of data distribution. The follow-pre scores in two groups of experiment and control were normal, with the T-test was used for data analysis. The scores in post-pre scores were not normal and the Mann-Whitney test was used.

Table 2
One-Sample Kolmogorov-Smirnov test for normality of data distribution

Group	*Post-Pre SR scores*	*Follow-Pre SR scores*	*Post-Pre Short SR scores*	*Follow-Pre Short SR scores*	*Post-Pre Long SR scores*	*Follow-Pre Long SR scores*
Intervention	P = 0.605	P = 0.484	P = 0.312	P = 0.270	P = 0.421	P = 0.230
Control	P = 0.001	P = 0.876	P < 0.001	P = 0.347	P < 0.001	P = 0.883

The mean differences in the scores for the pre-test, post-test, of SR, short SR and long SR in two groups of intervention and control are shown in *Table 3*. The mean difference score between the post-test and pre-test of the interventional group was 9.70 and the control group was 0.82, which indicates a significant increase in the self-regulation of the interventional group (< 0.001). Therefore, the intervention was effective for those who participated in the program. The effect sizes were 0.69, 0.49, and 0.89 for SR, Short SR and long SR respectively, using Cohen's effect size (Sullivan & Feinn 2012).

Table 3
Mean difference score between pre-test and post-test of SR, short SR, and long SR

Variables	*Intervention*	*Control*	*ES**	*P-Value†*
	Mean ± SD			
SR	9.70 ± 11.72	0.82 ± 4.09	0.69	<0.001
Short SR	4. 84 ± 7.02	0.64 ± 2.52	0.49	<0.001
Long SR	5.95 ± 8.72	0.18 ± 3.25	0.89	<0.001

*ES: Effect Size
†Mann-Whitney test.

The mean differences in the scores for the pre-test, follow-up of SR, short SR and long SR in interventional and control groups are shown in *Table 4*. The mean difference scores for SR, short SR, and long SR in the interventional group are significant in follow-up (p = 0.003, 0.013 and 0.001respectively), which means that the effect of intervention is maintained in follow-up.

Table 4
Mean difference score between follow-up and pre-test of SR, short SR, and long SR

	Intervention	*Control*	*t*	*P-Value**
	Mean ± SD			
SR	9.20 ±15.98	0.38 ± 16.30	3.017	0.003
Short SR	4.49 ±8.53	0.57 ± 8.57	2.531	0.013
Long SR	5.30± 8.21	0.13 ± 8.28	3.459	0.001

*T-test.

The mean scores from three time points (T1, T2, and T3) and two groups (intervention vs. control) were also analyzed with 'repeated measure between subjects ANOVA' (mixed method) as a within and between effect, method.

The results showed that in the intervention group, the SR, Short SR, and Long SR mean scores were significantly different between T1, T2 and T3 measurements ($P < 0.001$). In the control group, no significant differences existed between T1, T2, T3 measurements in each of the SR, Short-SR, or Long SR scores ($P > 0.05$). The Bonferroni post hoc test for paired comparisons in the intervention group showed a significant difference between mean scores in T1-T2 and also between T1-T3 measurements for all of the three dependent variables SR ($P < 0.001$), Short SR ($P < 0.001$) and Long SR ($P < 0.001$). An overview of the inferential statistics can be seen in *Table 5*.

Table 5
An overview of the inferential statistics for the factors Time (baseline, week 6/end of resilience program, weak 14/follow-up) and Group (intervention vs. control), and Self-regulation as dependent variables

Degree of freedom	*Time (2,240)*		*p-value*	*Group (1, 120)*		*p-value*	*TimeGroup Interaction (2, 240)*		*p-value*	*Green-house-Geisser Epsilon*
	F	η^2		*F*	η^2		*F*	η^2		
Self-Regulation	11.197	0.085	P<0.001	23.934	0.166	P<0.001	8.631	0.067	P=0.001	0.736
Short Self-regulation	10.849	0.082	P<0.001	9.119	0.071	P=0.003	6.423	0.051	P=0.004	0.797
Long Self-regulation	11.524	0.088	P<0.001	19.794	0.142	P<0.001	10.295	0.079	P<0.001	0.930

4. Discussion

The findings of this study indicate that the participants in the experimental group made greater gains in comparison to those in the control group in self-regulation and its two dimensions: long and short term self-regulations. Promotion of self-regulation or related domains, using various interventional programs, is reported (Burckhardt 2017; Luckner & Sebald 2013; Luckner & Movahedazarhouligh 2019; Soleimanieh et al. 2013; Lakes & Hoyt 2004; Minnaert et al. 2017; Smith et al. 2017; Tominey & McClelland 2011; Westhues et al. 2009). The present study considered two dimensions of self-regulation for measurement, and other research into different interventions might look at other aspects of self-regulation.

For example, the study (Burckhardt 2017) done for children and adolescents with special needs indicated different results. The mindfulness curriculum was applied for autism, learning disabilities, and other health disorders and the result showed no significant effect on the self-regulation of students even though positive outcomes occurred for managing stress and anxiety, greater focus and attention, better conflict management, and increased self-compassion. Luckner and Sebald (2013), in their study about promoting the self-determination of students with hearing impairment, stated that self-determination enables individuals to make choices and engage in goal-directed, self-regulated behavior. They assert that even though paucity of research or attention has been directed to this construct in students with hearing loss, making opportunities and practicing the activities related to self-determination appropriate interventions seem necessary when these would help promote this skill in students. They concluded that teaching the component elements of social-determination provides students with strategies to set goals, solve problems, work toward achieving goals, and helps them develop the ability to be responsible and take control of their lives. Luckner and Movahedazarhouligh (2019), did a research synthesis on social-emotional interventions with children and youth who are deaf or hard of hearing and stated that social-emotional interventions play an important role on emotional well-being and emotional health effects of social interaction. The study suggests that explicit instruction in social skills may be beneficial for students who are deaf or hard of hearing. In the present study, the teaching of social, communicational, interpersonal and emotional skills was considered in some of the programs' lessons. Some skills that students learned were: how can they express their feelings and emotions, respect for others' feelings, to start or continue a relationship, getting along with their peers and other people, expressing their needs and getting help when they need it. As the importance of explicit instruction in teaching is determined by studies, and perhaps students with disabilities may require significant differences in treatment when using the interventions, this study used explicit teaching, focused on SR-related knowledge and skills in the curriculum. Therefore, positive outcomes of the present study lead us to the conclusion that the program was well planned and instructed to its aim, which was promoting self-regulation skills of adolescent students with hearing loss. Even though such experimental or quasi-experimental studies in interventional programs promoting self-regulation in adolescents with hearing loss were not found, comparing the effect size of the present study (d = 0.69) to other interventional studies on enhancing self-regulation in children and adolescents without disability, indicates a large effect of the resilience intervention; thus the effectiveness of this program. Pandey and colleagues (2018) found that the overall effect of 42 intervention on SR was statistically significant and favored the intervention (pooled effect size d = 0.42; 95% CI, 0.32–0.53). The social and personal skills interventions had a higher mean effect size (d = 0.64; 95% CI, 0.42–0.86).

The scores of post-test and follow-up in this study indicated that students in the intervention group had a significant improvement in short – and even more in long term – self-regulation. A study (Oriol et al. 2017) also found high scores of self-control (short and long term) in adolescents. Short and long-term self-regulation is associated with all indicators of adjustment. Higher levels of both forms of self-regulation are associated with higher levels of prosocial behavior and lower levels of behavioral difficulties (Moilanen 2007); in this study, the program addressed these social, emotional, and behavioral skills. Adolescents seem to have an increased maturation of the prefrontal cortex and are capable of setting goals and long-term plans (Blakemore et al. 2007). However, sometimes adolescents set goals which could be more induced by extrinsic motivations such as social pressure than intrinsic motivations (Wong & Csikszentmihalyi 1991), and cause them tedious and frustrating feelings. During puberty, adolescents may have a lot of trouble controlling their impulses and make proper decisions when their objective involves emotional components (Bell & McBride 2010). A different result in goal-setting abilities of adolescent students with emotional and behavioral disorders was found in a study (Smith et al. 2017). The study showed no evidence of the intervention curriculum (I Control) affecting students' self-reported goal setting. The insufficient time for the gains in knowledge to transfer to goal-setting skill development could be the reason for having such a result.

The results of the present study support the effectiveness of a resilience intervention program on the self-regulation skills of children with hearing loss. The outcomes have thrilling and important suggestions for educators and mental health professionals interested in promoting positive youth development. Self-regulatory abilities can be taught to a broad range of children with different abilities, and in ways that are highly attractive. The interventions can be interesting, enjoyable, challenging, and rewarding while attaining the objective of increasing self-regulatory abilities.

This study has a few limitations. The use of the self-reporting form of measurement could have affected the results. The answers may be exaggerated, or an individual may be embarrassed to reveal private details, and different biases can affect the findings. Future research can address this by using assessment instruments completed by parents/teachers and/or professional observers. Also, the participants were from public inclusive schools in a large city and the results cannot be generalized to other students with hearing loss in different settings and situations. Lastly, the present research did not consider the impact of resilience intervention on the components of the short term (control of impulses, attention and emotional control or regulation of the immediate context), and long term SR (components of SR for a period of time, several weeks, months, or years for example, an adolescent setting goals and making plans), which can be examined by upcoming studies.

References

Adibsereshki, N., N. Hatamizadeh, F. Sajedi & A. Kazemnejad (2019) 'The Effectiveness of a Resilience Intervention Program on Emotional Intelligence of Adolescent Students with Hearing Loss', *Children* 6(3), 48–57 (https://doi.org/10.3390/children6030048).

American Speech-Language-Hearing Association (2015) 'Type, Degree, and Configuration of Hearing Loss', *Audiology Information Series*, retrieved 21 Sep 2021 from https://www.asha.org/siteassets/uploadedfiles/ais-hearing-loss-types-degree-configuration.pdf.

Angelides, P. & C. Aravi (2007) 'The Development of Inclusive Practices as a Result of the Process of Integrating Deaf/Hard of Hearing Students', *European Journal of Special Needs Education* 22(1), 63–74 (https://doi.org/10.1080/08856250601082299).

Bandura, A., G.V. Caprara, C. Barbaranelli, M. Gerbino & C. Pastorelli (2003) 'Role of Affective Self-Regulatory Efficacy in Diverse Spheres of Psychosocial Functioning', *Child Development* 74 (3), 769–82 (https://doi.org/10.1111/1467-8624.00567).

Bell, C.C. & D.F. Mcbride (2010) 'Affect Regulation and Prevention of Risky Behaviors', *JAMA* 304(5), 565–66 (https://doi.org/10.1001/jama.2010.1058).

Berger, A. (2011) *Self-Regulation: Brain, Cognition, and Development* (Washington: American Psychological Association) (https://doi.org/10.1037/12327-000).

Bierman, K.L., R.L. Nix, M.T. Greenberg, C. Blair & C.E. Domitrovich (2008) 'Executive Functions and School Readiness Intervention: Impact, Moderation, and Mediation in the Head Start REDI Program', *Development and Psychopathology* 20(3), 821–43 (https://doi.org/10.1017/S0954579408000394).

Bilde, J., M. Vansteenkiste & W. Lens (2011) 'Understanding the Association Between Future Time Perspective and Self-Regulated Learning Through the Lens of Self-Determination Theory', *Learning and Instruction* 21 (3), 332–44 (https://doi.org/10.1016/j.learninstruc.2010.03.002).

Blakemore, S.-J., H. Den Ouden, S. Choudhury & C. Frith (2007) 'Adolescent Development of the Neural Circuitry for Thinking About Intentions', *Social Cognitive and Affective Neuroscience* 2(2), 130–39 (http://doi.org/10.1093/scan/nsm009).

Bodrova, E. & D.J. Leong (2008) 'Developing Self-Regulation in Kindergarten. Can We Keep All the Crickets in the Basket?', *Young Children* 63(2), 56–58, retrieved 29 Sep 2021 from http://talkingtogether.com.au/wp-content/uploads/2018/09/developing-self-regulation-to-get-ready-for-kindergarten.pdf.

Bonillo, D.B. (2017) 'Developing Social-Emotional Competence Interventions that Facilitate Emotional and Behavioral Self-Regulation', *Doctor of Education*

(Ed.D) in Leadership Dissertations (Irvine: Concordia University Irvine) retrieved 29 Sep 2021 from http://hdl.handle.net/11414/3276.

Borders, C.M., D. Barnett & A.M. Bauer (2010) 'How Are They Really Doing? Observation of Inclusionary Classroom Participation for Children with Mild–to–Moderate Deafness', *Journal of Deaf Studies and Deaf Education* 15(4), 348–57 (https://doi.org/10.1093/deafed/enq028).

Brown, P.M. & A. Cornes (2015) 'Mental Health of Deaf and Hard-of-Hearing Adolescents: What the Students Say', *Deaf Studies and Deaf Education* 20(1), 75–81 (https://doi.org/10.1093/deafed/enu031).

Buckner, J.C., E. Mezzappa & W.R. Beardslee (2009) 'Self-Regulation and its Relations to Adaptive Functioning in Low Income Youths', *American Journal of Orthopsychiatry* 79(1), 19–30 (https://doi.org/10.1037/a0014796).

Burckhardt, C.B. (2017) 'Mindfulness in the Special Education Classroom: A Mixed Methods Pilot Study of the Learning to Breathe Mindfulness Curriculum', *EDT – Doctoral Dissertations* (Johns Hopkins University, Baltimore) retrieved 29 Sep 2021 from http://jhir.library.jhu.edu/handle/1774.2/44730.

Calkins, S.D. & N.A. Fox (2002) 'Self-Regulatory Processes in Early Personality Development: A Multilevel Approach to the Study of Childhood Social Withdrawal and Aggression', *Development and Psychopathology* 14(3), 477–98 (https://doi.org/10.1017/S095457940200305X).

Coll, K.M., M.M. Cutler, P. Thobro, R. Haas & S. Powell (2009) 'An Exploratory Study of Psychosocial Risk Behaviors of Adolescents Who Are Deaf or Hard of Hearing: Comparisons and Recommendations', *American Annals of the Deaf* 154(1), 30–35 (https://doi.org/10.1353/aad.0.0074).

Collair, L.J. (2001) *Indicators of Successful Inclusion of a Learner Who is Deaf in a Mainstream Class* (Med thesis, University of Stellenbosch, South Africa) retrieved 29 Sep 2021 from http://hdl.handle.net/10019.1/52305).

Compas, B.E., J.K. Connor-Smith, H. Saltzman, A.H. Thomsen & M.E. Wadsworth (2001) 'Coping with Stress During Childhood and Adolescence: Problems, Progress, and Potential in Theory and Research', *Psychological Bulletin* 127(1), 87–127 (https://doi.org/10.1037//0033-2909.127.1.87).

Constantinescu-Sharp, G., R.L. Philips, A. Davis, D. Dornan, A. Hogan (2015) 'Exploring the Impact of Spoken Language on Social Inclusion for Children with Hearing Loss in Listening and Spoken Language Early Intervention', *Volta Review* 115(2), 153–81, retrieved 29 Sep 2021 from https://researchoutput.csu.edu.au/en/publications/exploring-the-impact-of-spoken-language-on-social-inclusion-for-c.

Dammeyer, J. (2009) 'Psychosocial Development in a Danish Population of Children with Cochlear Implants and Deaf and Hard–of–Hearing Children', *Journal of Deaf Studies and Deaf Education* 15(1), 50–58 (https://doi.org/10.1093/deafed/enp024).

Denham, S.A. (2006) 'Social–Emotional Competence as Support for School Readiness: What Is It and How Do We Assess It?', *Early Education and Development* 17(1), 57–89 (https://doi.org/10.1207/s15566935eed1701_4).

Demetriou, A. (2000) 'Chapter7 - Organization and Development of Self-Understanding and Self-Regulation: Toward a General Theory' in M. Boekaerts, P.R. Pintrich & M. Zeidner, eds., *Handbook of Self-Regulation* (Cambridge: Academic Press) 209–51 (https://doi.org/10.1016/B978-012109890-2/50036-6).

Dias, P.C., J.A.G. del Castillo & K.L. Moilanen (2014) 'The Adolescent Self-Regulatory Inventory (ASRI) Adaptation to Portuguese Context1', *Paidéia (Ribeirao Preto)* 24, 58 (https://doi.org/10.1590/1982-43272458201403).

Eisenberg, N., C. Valiente, R.A. Fabes, C.L. Smith, M. Reiser, S.A. Shepard, S.H. Losoya, I.K. Guthrie, B.C. Murphy & A.J. Cumberland (2003) 'The Relations of Effortful Control and Ego Control to Children's Resiliency and Social Functioning', *Developmental Psychology* 39(4), 761–76 (https://doi.org/10.1037/0012-1649.39.4.761).

Elliot, A.J., T.M. Thrash & K. Murayama (2011) 'A longitudinal Analysis of Self-Regulation and Well-Being: Avoidance Personal Goals, Avoidance Coping, Stress Generation, and Subjective Well-Being', *Journal of Personality* 79(3), 643–74 (https://doi.org/10.1111/j.1467-6494.2011.00694.x).

Eriks-Brophy, A., A. Durieux-Smith, J. Olds, E. Fitzpatrick, Ch. Duquette & J. Whittingham (2006) 'Facilitators and Barriers to the Inclusion of Orally Educated Children and Youth with Hearing Loss in Schools: Promoting Partnerships to Support Inclusion', *Volta Review* 106(1) 53–88, retrieved 2021 Sep 29 from https://www.proquest.com/openview/a9797b6cf852e57bffec9e993b-42f9c0/1?pq-origsite=gscholar&cbl=41448.

Fellinger, J., D. Holzinger & R. Pollard (2012) 'Mental Health of Deaf People', *The Lancet* 379(9820), 1037–44 (https://doi.org/10.1016/S0140-6736(11)61143-4).

Galla, B.M., & A.L. Duckworth (2015) 'More than Resisting Temptation: Beneficial Habits Mediate the Relationship Between Self-Control and Positive Life Outcomes', *Journal of Personality and Social Psychology* 109(3), 508–25 (https://doi.org/10.1037/pspp0000026).

Garcia-Vesga, M.C. & E. Domíngues De La Ossa (2013) 'Desarrollo teórico de la Resiliencia y su aplicación en situaciones adversas: Una revisión analítica', *Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud* 11(1), 63–77 (https://doi.org/10.11600/1692715x.1113300812).

Gardner, T.W., Dishion T.J. & A.M. Connell (2008) 'Adolescent Self-Regulation as Resilience: Resistance to Antisocial Behavior Within the Deviant Peer Context', *Journal of Abnormal Child Psychology* 36, 273–84 (https://doi.org/10.1007/s10802-007-9176-6).

Gestsdottir, S. & R.M. Lerner (2008) 'Positive Development in Adolescence: The Development and Role of Intentional Self-Regulation', *Human Development* 51(3), 202–24 (https://doi.org/10.1159/000135757).

Gilmore, L., M. Campell, I. Shochet, R. Garland, T. Smyth, C. Roberts & D. West (2014) 'Promoting Resilience in Children with Intellectual Disability: A Randomized Controlled Trial in Australian Schools' in S. Prince-Embury & D. Saklofske, eds., *Resilience Interventions for Youth in Diverse Populations* (New York: Springer) 353–73 (https://doi.org/10.1007/978-1-4939-0542-3_16).

Greenberg, M.T. & C.A. Kusché (1998) 'Preventive Intervention for School–Age Deaf Children: The PATHS Curriculum', *Journal of Deaf Studies and Deaf Education* 3(1), 49–63 (https://doi.org/10.1093/oxfordjournals.deafed.a014340).

Hall, P.A. & G.T. Fong (2007) 'Temporal Self-Regulation Theory: A Model for Individual Health Behavior', *Health Psychology Review* 1(1), 6–52 (https://doi.org/10.1080/17437190701492437).

Hatamizadeh, N., M. Ghasemi, A. Saeedi & A. Kazemnejad (2008) 'Perceived Competence and School Adjustment of Hearing Impaired Children in Mainstream Primary School Settings', *Child Care Health and Development* 34(6), 789–94 (https://doi.org/10.1111/j.1365-2214.2008.00871.x).

Hofer, J., H. Busch & J. Kärtner (2011) 'Self-Regulation and Well-Being: The Influence of Identity and Motives', *European Journal of Personality* 25(3), 211–24 (https://doi.org/10.1002/per.789).

King, K.M., L.J. Lengua, K.C. Monahan (2013) 'Individual Differences in the Development of Self-Regulation During Pre-adolescence: Connections to Context and Adjustment', *Journal of Abnormal Child Psychology* 41, 57–69 (https://doi.org/10.1007/s10802-012-9665-0).

Kirman, A. & H.Y. Sari (2013) 'Health Status of Hearing-Impaired Children and Adolescents', *International Journal of Nursing Practice* 19(3), 233–40 (https://doi.org/10.1111/ijn.12071).

Knutson, J.F. & C.R. Lansing (1990) 'The Relationship Between Communication Problems and Psychological Difficulties in Persons with Profound Acquired Hearing Loss', *Journal of Speech and Hearing Disorders* 55(4), 656–64 (https://doi.org/10.1044/jshd.5504.656).

Krueger, R.F., B.M. Hicks, C.J. Patrick, S.R. Carlson, W.G. Iacono & M. Mcgue (2002) 'Etiologic Connections among Substance Dependence, Antisocial Behavior and Personality: Modeling the Externalizing Spectrum', *Journal of Abnormal Psychology* 111(3), 411–24 (https://doi.org/10.1037/0021-843X.111.3.411).

Lakes, K.D. & W.T. Hoyt (2004) 'Promoting Self-Regulation Through School-Based Martial Arts Training', *Journal of Applied Developmental Psychology* 25(3), 283–302 (https://doi.org/10.1016/j.appdev.2004.04.002).

Luckner, J.L. & S. Movahedazarhouligh (2019) 'Social–Emotional Interventions with Children and Youth Who are Deaf or Hard of Hearing: A Research

Synthesis', *Journal of Deaf Studies and Deaf Education* 24(1), 1–10 (https://doi.org/10.1093/deafed/eny030).

Luckner, J.L. & A.M. Sebald (2013) 'Promoting Self-Determination of Students Who Are Deaf or Hard of Hearing', *American Annals of the Deaf* 158(3), 377–86 (http://doi.org/10.1353/aad.2013.0024).

Luthar, S.S., D. Cicchetti & B. Becker (2000) 'The Construct of Resilience: A Critical Evaluation and Guidelines for Future Work', *Child Development* 71(3), 543–62 (https://doi.org/10.1111/1467-8624.00164).

Martin, J. & A.-M. Mclellan (2008) 'The Educational Psychology of Self-Regulation: A Conceptual and Critical Analysis', *Studies in Philosophy and Education* 27, 433–48 (https://doi.org/10.1007/s11217-007-9060-4).

Martin, A.J., R.J. Collie & E. Frydenberg (2017) 'Social and Emotional Learning: Lessons Learned and Opportunities Going Forward' in E. Frydenberg, A. Martin, R. Collie, eds., *Social and Emotional Learning in Australia and the Asia-Pacific* (Singapore: Springer) 459–71 (https://doi.org/10.1007/978-981-10-3394-0_24).

Masten, A.S. (1999) 'The Promise and Perils of Resilience Research as a Guide to Preventive Interventions: Comments on Rolf and Johnson: Positive Life Adaptations' in M.D. Glantz & J. Johnson eds., *Resilience and Development: Positive Life Adaptations* (New York: Plenum) 251–57, retrieved 1 Oct 2021 from https://experts.umn.edu/en/publications/the-promise-and-perils-of-resilience-research-as-a-guide-to-preve.

Mccarthy-Jones, S. & C. Fernyhough (2011) 'The Varieties of Inner Speech: Links Between Quality of Inner Speech and Psychopathological Variables in a Sample of Young Adults', *Consciousness and Cognition* 20(4), 1586–93 (https://doi.org/10.1016/j.concog.2011.08.005).

Miller, R.B. & S.A. Brickman (2004) 'A Model of Future Oriented Motivation and Self-Regulation', *Educational Psychology Review* 16, 9–33 (https://doi.org/10.1023/B:EDPR.0000012343.96370.39).

Minnaert A., A. Prince & M.C. Opdenakker (2017) 'The Effect of Self-Regulated Strategy Instruction and Behavioral Consultation on Motivation: A Longitudinal Study on the Effect of School-Based Interventions in Secondary Education', *Frontiers in Education* 2, 61 (https://doi.org/10.3389/feduc.2017.00061).

Mischel, W., Y. Shoda, P.K. Peake (1988) 'The Nature of Adolescent Competencies Predicted by Preschool Delay of Gratification', *Journal of Personality and Social Psychology* 54(4), 687–96 (https://doi.org/10.1037/0022-3514.54.4.687).

Moffitt, T.E., L. Arseneault, D. Belsky, N. Dickson, R.J. Hancox, H.L. Harrington, R. Houts, R. Poulton, B.W. Roberts, S. Ross, M.R. Sears, W.M. Thomson & A. Caspi (2011) 'A Gradient of Childhood Self-Control Predicts Health, Wealth, and Public Safety', *Proceedings of the National Academy of Sciences of the United States of America* 108(7), 2693–98 (https://doi.org/10.1073/pnas.1010076108).

Moilanen, K.L. (2007) 'The Adolescent Self-Regulatory Inventory: The Development and Validation of a Questionnaire of Short-Term and Long-Term Self-Regulation', *Journal of Youth and Adolescence* 36, 835–48 (https://doi.org/10.1007/s10964-006-9107-9).

Moores, D.F. (2001) *Educating the Deaf: Psychology, Principles and Practices* (4th ed.; Boston: Houghton Mifflin) retrieved 1 Oct 2021 from http://file.upi.edu/Direktori/FIP/JUR._PEND._LUAR_BIASA/197004171994022-IMAS_DIANA_APRILIA/RINGKASAN_1.pdf.

Murray, D.W., K. Rosanbalm & C. Christopoulos (2016) *Self-Regulation and Toxic Stress Report 3: A Comprehensive Review of Self-Regulation Interventions from Birth Through Young Adulthood* (OPRE Report 2016-34) (Washington: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services) retrieved 1 Oct 2021 from https://fpg.unc.edu/publications/self-regulation-and-toxic-stress-report-3-comprehensive-review-self-regulation.

Murray, D.W., K. Rosanbalm, C. Christopoulos & A. Hamoudi (2015) *Self-Regulation and Toxic Report 1: Foundations for Understanding Self-Regulation from an Applied Perspective* (OPRE Report #2015-21) (Washington: Office of Planning, Research and Evaluation, Administration of Children and Families, US Department of Health and Human Services) retrieved 1 Oct 2021 from https://www.acf.hhs.gov/sites/default/files/documents/report_1_foundations_paper_final_012715_submitted_508_0.pdf.

Neal, D.J. & K.B. Carey (2005) 'A Follow-Up Psychometric Analysis of the Self-Regulation Questionnaire', *Psychology of Addictive Behaviors* 19(4), 414–22 (https://doi.org/10.1037/0893-164X.19.4.414).

Nunes, A.D., C.R. Silva, S.A. Balen, D.L. Souza, I.R. Barbosa (2019) 'Prevalence of Hearing Impairment and Associated Factors in School-Aged Children and Adolescents: A Systematic Review', *Brazilian Journal of Otorhinolaryngology* 85(2), 244–53 (http://doi.org/10.1016/j.bjorl.2018.10.009).

Oriol, X., R. Miranda, J.C. Oyanedel & J. Torres (2017) 'The Role of Self-Control and Grit in Domains of School Success in Students of Primary and Secondary School', *Frontiers in Psychology* 8, 1716 (https://doi.org/10.3389/fpsyg.2017.01716).

Pandey, A., D. Hale, S. Das, A.-L. Goddings, S.-J. Blakemore, & R.M. Viner (2018) 'Effectiveness of Universal Self-Regulation–Based Interventions in Children and Adolescents: A Systematic Review and Meta-Analysis', *JAMA Pediatrics* 172(6), 566–75 (https://doi.org/10.1001/jamapediatrics.2018.0232).

Quigley, S.P. & V.P. Paul (1994) *Language and Deafness: Study Guide* (San Diego: Singular).

Rimm-Kaufman, S.E. & Y-J. I. Chiu (2007) 'Promoting Social and Academic Competence in the Classroom: An Intervention Study Examining the Contribution

of the Responsive Classroom Approach', *Psychology in the Schools* 44(4), 397–413 (https://doi.org/10.1002/pits.20231).

Rimm-Kaufman, S.E, M.D. Storm, B.E. Sawyer, R.C. Pianta & K.M. LaParo (2006) 'The Teacher Belief Q-Sort: A Measure of Teachers' Priorities in Relation to Disciplinary Practices, Teaching Practices, and Beliefs About Children', *Journal of School Psychology* 44(2), 141–65 (https://doi.org/10.1016/j.jsp.2006.01.003).

Rosa, O.M.A. & L.M. Villar Angulo (2019) 'Attitudes of Children with Hearing Loss towards Public Inclusive Education', *Education Sciences* 9(3), 244–56 (https://doi.org/10.3390/educsci9030244).

Rutter, M. (1985) 'Resilience in the Face of Adversity: Protective Factors and Resistance to Psychiatric Disorder', *British Journal of Psychiatry* 147(6), 598–611 (https://doi.org/10.1192/bjp.147.6.598).

Rutter, M. (2012) 'Resilience as a Dynamic Concept', *Development and Psychopathology* 24(2), 335– 44 (https://doi.org/10.1017/S0954579412000028).

Sawyer, A.C.P., C.R. Chittleborough, M.N. Mittinty, L.R. Miller-Lewis, M.G. Sawyer, T. Sullivan & J.W. Lynch (2014) 'Are Trajectories of Self-Regulation Abilities from Ages 2–3 to 6–7 Associated with Academic Achievement in the Early School Years?', *Child: Care, Health and Development* 41(5), 744–54 **(**https://doi.org/10.1111/cch.12208).

Seligman, M.E.P., R.M. Ernst, J. Gillham, K. Reivich & M. Linkins (2009) 'Positive Education: Positive Psychology and Classroom Interventions', *Oxford Review of Education* 35(3), 293–311 (https://doi.org/10.1080/03054980902934563).

Shargorodsky, J., S.G. Curhan, G.C. Curhan & R. Eavey (2010) 'Change in Prevalence of Hearing Loss in US Adolescents', *JAMA* 304(7), 772–78 (https://doi.org/10.1001/jama.2010.1124).

Shochet, I., A. Wurfl & R. Hoge (2004) 'The Resourceful Adolescent Programs: Working with Teenagers in Queensland, Australia' in *Mental Health Promotion: Case Studies from Countries* (Switzerland: WHO and World Federation for Mental Health) 10–12.

Smith, S.W., A.P. Daunic, J. Algina, D.L. Pitts, K.L. Merrill, M.M. Cumming & C. Allen (2017) 'Self-Regulation for Students with Emotional and Behavioral Disorders: Preliminary Effects of the I Control Curriculum', *Journal of Emotional and Behavioral Disorders* 25(3), 143–56 (https://doi.org/10.1177/1063426616661702).

Soleimanieh Naeini, T., F. Keshavarzi Ashadi, N. Hatamizadeh & E. Bakhshi (2013) 'The Effect of Social Skills Training on Perceived Competence of Female Adolescents with Deafness', *Iran Red Crescent Medical Journal* 15(12), e5426 (https://doi.org/10.5812/ircmj.5426).

Stevenson, J., J. Kreppner, H. Pimperton, S. Worsfold & C. Kennedy (2015) 'Emotional and Behavioral Difficulties in Children and Adolescents with Hear-

ing Impairment: A Systematic Review and Meta-Analysis', *European Child & Adolescent Psychiatry* 24, 477–96 (https://doi.org/10.1007/s00787-015-0697-1).

Stevenson, J., H. Pimperton, J. Kreppner, S. Worsfold, E. Terlektsi & C. Kennedy (2017) 'Emotional and Behavior Difficulties in Teenagers with Permanent Childhood Hearing Loss', *International Journal of Pediatric Otorhinolaryngology* 101, 186–95 (https://doi.org/10.1016/j.ijporl.2017.07.031).

Sullivan, G.M. & R. Feinn (2012) 'Using Effect Size—Or Why the P Value Is Not Enough', *Journal of Graduate Medical Education* 4(3), 279–82 (https://doi.org/10.4300/JGME-D-12-00156.1).

Tominey, S.L. & M.M. Mcclelland (2011) 'Red Light, Purple Light: Findings from a Randomized Trial Using Circle Time Games to Improve Behavioral Self-Regulation in Preschool', *Early Education & Development* 22(3), 489–519 (https://doi.org/10.1080/10409289.2011.574258).

Tye-Murray, N., S. Hale, B. Spehar, J. Myerson & M.S. Sommers (2014) 'Lipreading in School-Age Children: The Roles of Age, Hearing Status, and Cognitive Ability', *Journal of Speech, Language, and Hearing Research* 57(2), 556–65 (https://doi.org/10.1044/2013_JSLHR-H-12-0273).

Vallotton, C., C. Ayoub (2011) 'Use Your Words: The Role of Language in the Development of Toddlers' Self-Regulation', *Early Childhood Research Quarterly* 26(2), 169–81 (https://doi.org/10.1016/j.ecresq.2010.09.002).

Vostanis, P., M. Hayes, M. Du Feu, J. Warren (2007) 'Detection of Behavioral and Emotional Problems in Deaf Children and Adolescents: Comparison of Two Rating Scales', *Child: Care, Health and Development* 23(3), 233–46 (https://doi.org/10.1111/j.1365-2214.1997.tb00966.x).

Vygotsky, L.S. (1962) 'Thought and Word' in L.S. Vygotsky & E. Hanfmann, G. Vakar, eds., *Thought and Language. Studies in communication* (Cambridge: MIT) 119–53 (https://doi.org/10.1037/11193-007).

Westhues, A., A. S. Hanbidge, R. Gebotys, & A. Hammond (2009) 'Comparing the Effectiveness of School-Based and Community-Based Delivery of an Emotional Regulation Skills Program for Children', *School Social Work Journal* 34(1), 74–95, retrieved 1 Oct 2021 from https://eric.ed.gov/?id=EJ893730.

Wong, M.M. & M. Csikszentmihalyi (1991) 'Motivation and Academic Achievement: The Effects of Personality Traits and the Duality of Experience', *Journal of Personality* 59(3), 539–74 (https://doi.org/10.1111/j.1467-6494.1991.tb00259.x).

World Health Organization (2012) *WHO Global Estimates on Prevalence of Hearing Loss* retrieved 1 Oct 2021 from https://www.who.int/pbd/deafness/WHO_GE_HL.pdf.

Zimbardo, P.G. & J.N. Boyd (1999) 'Putting Time in Perspective: A Valid, Reliable Individual-Differences Metric', *Journal of Personality and Social Psychology* 77(6), 1271–88 (https://doi.org/10.1037/0022-3514.77.6.1271).

Zimmer-Gembeck, M.J. & E.A. Skinner (2008) 'Adolescents Coping with Stress: Development and Diversity', *The Prevention Researcher* 15(4), 3–7, retrieved 1 Oct 2021 from https://eric.ed.gov/?id=EJ823350.

Zimmer-Gembeck, M.J. & E.A. Skinner (2011) 'The Development of Coping Across Childhood and Adolescence: An Integrative Review and Critique of Research', *International Journal of Behavioral Development* 35(1), 1–17 (https://doi.org/10.1177/0165025410384923).

Zimmerman, B.J. (1995) 'Self-Regulation Involves More than Metacognition: A Social Cognitive Perspective', *Educational Psychologist* 30(4), 217–21 (https://doi.org/10.1207/s15326985ep3004_8).

Zimmerman, K. & P. Brugger (2013) 'Signed Soliloquy: Visible Private Speech', *Journal of Deaf Studies and Deaf Education* 18(2), 261–70 (https://doi.org/10.1093/deafed/ens072).

Zolkoski, S.M. & L.M. Bullock (2012) 'Resilience in Children and Youth: A Review', *Children and Youth Services Review* 34(12), 2295–2303 (https://doi.org/10.1016/j.childyouth.2012.08.009).

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SEDENTARY LIFESTYLE MAY CONTRIBUTE TO THE RISK OF DEPRESSION DURING THE COVID-19 PANDEMIC

A Snapshot of Hungarian Adolescents

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Background: Social exclusion usually contributes to an increased vulnerability to mental health problems and risky health behaviors. This study aims to identify the role of health behavior in the increased risk of depressive symptoms among adolescents during the coronavirus pandemic in Hungary.
Methods: A total of 705 high school students participated in our study (M = 15.9 years; SD = 1.19). The self-administered questionnaire included items about sociodemographics, eating habits, physical activity, sedentary behavior, and substance use. Depressive symptoms were measured using the short version of the Child Depression Inventory. Descriptive statistics and binary logistic regression were used to analyze our results.
Results: Daily fruit and vegetable consumption was reported by 21.7% and 22.4% of respondents, respectively. The proportion of the respondents reporting daily sweets consumption stood at 13.2%, daily soft drinks consumption was 12.3%, and daily energy drink consumption tallied to 4.5%. More than one-third of the sample (35.5%) reported having breakfast every school day, which rose to 68.1% of the sample reporting breakfast on both weekend days. The rate of students engaged in daily physical activity was 6.5%, while 86.1% of them reported more than four hours screen time in a day. In addition, despite the mandatory confinement, a notable percentage of adolescents engaged in substance use. Consistent with previous studies, girls had a higher risk of depression. Low levels of physical activity and high levels of screen time – as well as alcohol and drug use – were associated with a high risk of depression.
Conclusions: We believe our study provided useful information on adolescent health behaviors that can lead to adolescents' depression, and that maintaining physical activity can prevent it even in these unusual circumstances.

Keywords: health behavior; physical activity; eating behavior; substance use; mental health

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1. Introduction

The coronavirus (COVID-19) epidemic has affected daily life worldwide; Hungary, like many other countries, applied several restrictions to slow the spread of the virus through increased social distancing. The restrictions impacted offices, restaurants, cinemas, sports facilities, and schools since the governments closed down such services. While these regulations might have helped slow the epidemic, social isolation during the quarantine increased vulnerability to mental health problems and risky health behaviors (e.g., Bates et al. 2020). Several studies reported psychological and behavioral effects, such as increased stress, anxiety, or insomnia (e.g., Pappa et al. 2020). Furthermore, a high risk of depression was also found in many cases (e.g., Chen et al. 2020). In addition, these variables are strongly associated and co-occur: there is a close correlation between depression and other behavioral problems due to elevated stress levels (Carroll et al. 2020).

Many factors can be associated with depression, including sociodemographics: socioeconomic status, gender, educational level, and income (e.g., Assari 2017). A close connection exists between depression and health behavior, such as eating habits (Lee & Allen 2021), substance use (Hodder et al. 2016), physical activity, and sedentary behavior (Feng et al. 2014). These associations were also found in coronavirus related studies. Duan and colleagues (2020) found that gender, age, place of residence, education level, and family status were correlated with depression and anxiety in an adolescent sample during the COVID-19 pandemic.

The association between eating behavior and depression has been well documented (Lee & Allen 2021). Several studies found negative changes in meal routines during the lockdown period. For example, Carroll and colleagues (2020) reported increased snack consumption and more cooking time. Another study done by Ammar and colleagues (2020) found similar changes. They reported unhealthier meal patterns (Ammar et al. 2020). According to Sidor and Rzymski (2020), half of the examined adults reported eating more than usual during the quarantine regime. The 'stay-at-home' period also has a role in adolescents' lifestyle and their eating habits. School closure was found as a mediator for the lack of appetite (Jiao et al. 2020), with a significant reduction in daily fruit and vegetable consumption being reported as well (López-Bueno et al. 2020). We might hypothesize that changes in their eating behavior could affect their mental well-being and depression during this period; however, there is a lack of studies about the role of eating habits in depression among adolescents.

Another important factor that may contribute to a lower level of mental well-being is physical activity (Pieh et al. 2020), since the lack of it may increase the risk factor development (e.g., Aoun et al. 2019; Hodder et al. 2016). Parallel with the reduction of social interactions and the lockdown of sports facilities, there was a decrease in levels of physical activity and an increase in sedentary behavior (Bates

et al. 2020). It is well established that physical activity has a protective role against depression (Feng et al. 2014). Not surprisingly, most studies report that significant decreases in physical exercise and increased screen time were associated with a higher tendency to depressive symptoms (Zhou et al. 2020). A similar trend was reported in Hungary as well. Ács and colleagues (2020) surveyed university students to rate their level of physical activity and sedentary behavior before and after the quarantine mandate was ordered. They found that physical activity was significantly lower and sedentary behavior was significantly higher during home confinement. Another study by Morvay-Sey and colleagues (2020) found that vigorous physical activity decreased by 40 minutes per week in the first wave of the pandemic. Kovács and colleagues found similar results involving adolescents (2021). According to their study, only one out of five children met the WHO (World Health Organisation 2013) guidelines.

Empirical evidence exists that a lack of social interactions could lead to elevated levels of substance use, with both being associated with mental health problems such as depression (Fairbairn & Sayette 2014). Lack of social networks, mental health problems, and substance use can form a vicious cycle. Isolated individuals are more likely to abuse drugs (Hawkley & Cacioppo 2010), smoke cigarettes (Dyal & Valente 2015), and use alcohol (Canham et al. 2016). Studies associated with the pandemic support these findings. For example, Czeisler and colleagues (2020) found increased substance use to be a coping mechanism for the stress or emotions related to the economic impacts of the COVID-19 epidemic (e.g., unpaid holiday, job loss). However, a lack of empirical investigation exists for substance use among adolescents during the pandemic. Recent research on this topic showed that while the percentage of adolescents who used substances decreased, the frequency of use increased among Canadian adolescents (Dumas et al. 2020).

These research findings suggest that it would be important to investigate correlates of depression, such as eating behaviors, physical activity, or substance use, during the 'stay-at-home' period. We assume that there is a close connection between depression and health behaviors. Learning more about the role of health behaviors in depressive symptoms may be particularly important since a high level of depression is associated with coronavirus symptoms (Ran et al. 2020), and certain forms of unhealthy behaviors can affect the progression of COVID-19 as well (e.g., smoking is a risk factor for the progression of COVID-19; Patanavanich & Glantz 2020).

Furthermore, the long-term effects of the pandemic on health behavior are still unknown. The Hungarian government ordered remote learning for high schools in the first wave (from March 17 to June 15, 2020) and the second wave (from November 11 to May 10, 2021) of the pandemic (Monostori 2021). Thus, the students were away from school approximately half of the academic year. We assume these unusual circumstances could affect both their health behavior and mental health.

Based on the literature and findings from previous studies, the primary goals of this study were twofold. First, this study aimed to explore the prevalence of health

behaviors such as healthy eating habits, physical activity, sedentary behavior, and substance use during the 'stay-at-home' era. Second, since developing depressive symptoms often increases in such challenging situations (Bhatia & bhatia 2007), we aimed to identify the role that sociodemographics and health behaviors (eating behavior and physical activity and substance use) might play in elevating the risk of depressive symptomatology in a sample of Hungarian adolescents after governmental restrictions were applied.

2. Material and methods

2.1. Sample and procedure

Ethical approval for this study was sought and obtained from the university's Institutional Review Board. The survey was launched three weeks after the Hungarian government ordered school closure for the high schools. Thus, the data collection occurred from December 6 to December 20, 2020. The online survey was voluntary, and recruitment occurred via social media (e.g., Facebook). It took approximately ten minutes to complete. In the survey instructions, the participants were asked to think about their activities, eating behavior, and substance use in the 'stay-at-home' period. The participants were ensured that the data was collected anonymously without IP addresses, GPS tracking, and no identifying data such as names were collected. All the participants provided informed consent online to participate in the study. A total of 719 high school students completed our online survey. However, 14 students were removed due to a failure to complete the survey correctly. Thus, our final sample involved 705 adolescents ranging from 14 to 19 years old. It included 264 boys (M = 15.8 years; SD = 1.09) and 441 girls (M = 16.0 years; SD = 1.27).

2.2. Measures

The survey in the present study was based on the questionnaire of the International Health Behavior in School-aged Children (HBSC) survey. HBSC is a cross-national study of adolescent health and well-being that examines several health behaviors factors such as eating behavior, oral health, injuries, physical activity, sedentary behavior, body image, and bullying (Inchley et al. 2020). Our study included only the following topics: eating behavior, physical activity, sedentary behavior and substance use. Besides these, the self-administered questionnaire included socio-demographic data (e.g., age, gender, education, and family background) and questions about depressive symptomatology.

2.2.1. Eating habits

Eating habits were measured with specific questions from the Hungarian version of the HBSC questionnaire (Németh 2014), such as 'How many times a week do you consume: fruit/vegetables/sweets/soft drinks (e.g., cola)/energy drinks?' The response categories were: never, less than once a week, two to four times a week, five to six times a week, once a day, and more than once a day. These variables were dichotomized as 'once a day or more' and 'less than once a day' and daily food/drink consumption was determined.

Besides eating habits, the frequency of having breakfast was asked with the question 'How do you usually have breakfast on school days/on the weekends?' (Response categories for weekdays were: never/one day/two days/three days/four days/five days; for the weekends: never/only on one day/on both days). Responses that indicated daily breakfast consumption (five days/on both days) were used to create dichotomized variables similar to the food/drink consumption measures.

2.2.2. Physical activity and sedentary behavior

Physical activity and screen time were determined from specific items from the HBSC study. The following questions measured physical activity: 'Over the past 7 days, on how many days were you physically active for a total of at least 60 min per day? Please add up all the time you spent in physical activity each day.' (Bobakova et al. 2015, 61). The response categories ranged from 0 to 7; however, it was recoded for analysis as follows: 7 days a week; 5–6 days; 3–4 days; 1–2 days; none.

Sedentary behavior was measured by screen time activities. The students were asked to estimate their screen time in the last seven days (e.g., 'How many hours a day do you spend using electronic devices such as a computer, tablet or smartphone'). Response categories were from 0 to more than seven hours (Németh 2014), and were categorized as the following: less than 1 hour; 2–3 hours; 4 or more hours.

2.2.3. Substance use

Smoking, alcohol use, and drug abuse were measured with separate single questions, a standard method among researchers to assess substance use (e.g., Behrouz & Aachi 2017; Harakeh et al. 2012). The students were asked to think about their time during the 'stay-at-home' period and indicate their frequency of these types of substance use. Answer categories were coded as 'daily'; 'less than once a week'; 'at least once a week'; 'never'. The variables were dichotomized as never used and occasional/daily use in the 'stay-at-home' period.

2.2.4. Child Depression Inventory

Depressive symptoms were measured with a short version of the Child Depression Inventory (CDI) based on the Health Behavior of School-Aged Children (HBSC) studies (Költő 2014). This version provided a possibility of comparing data with a national representative sample. The scale contained eight items. Each was scored on a three-point scale and then coded from 0 to 2 (0 = not at all; 1= moderate; 2 = severe) for each symptom type (e.g., sadness, suicidal thoughts). The total scores on the CDI range from 0 to 16. The final result was dichotomized to identify low and high levels of depressive symptoms. Based on previous studies, a score of 4 differentiated between children who had a high risk of depression from those with a low risk of depression (Költő 2014). Thus, our sample was divided into two groups (low risk of depression; high risk of depression). The scale's internal consistency showed good reliability in this study (Cronbach's alpha = 0.85).

2.3. Statistical analysis

After the data collection, SPSS for Windows 24.0 was used for data analysis. Besides descriptive statistics (e.g., means, standard deviations, absolute and relative frequencies), the Chi-square test was used to see the significant associations in eating behavior, physical activity, screen time, substance use**,** and depressive symptoms. Furthermore, we used binary logistic regression to estimate odds ratio (OR) and 95% confidence interval (CI) for detecting the predictive value of each factor of the high risk of depressive symptomatology, including sociodemographic variables, eating behavior, physical activity, screen time**,** and substance use. A p-value of 0.05 was used to define statistical significance.

3. Results

The recruited participants (N = 705) come from different regions of Hungary: 14.2% lived in the capital, 26.3% in bigger cities (> 100,000 inhabitants), 32.4% in smaller cities (≤ 100,000 inhabitants), and the rest in rural areas (27.1%). Most of the students lived with their parents (67.0%), and 73.5% of participants live in family residences. The students were asked to indicate the subjective financial status of their families: 68.6% of the sample rated themselves as middle-class; 20.9% rated themselves as upper-middle-class; 7.4% rated themselves as lower-middle-class; 1.8% rated themselves as upper-class; 1.3% rated themselves as lower class. The students were also asked about the positive coronavirus test result: 95.6% of the participants reported a negative result or had never been tested, and 4.4% of the sample reported positive results on their COVID-19 test.

Table 1 displays the absolute and relative frequencies of eating behavior, physical activity, sedentary behavior, substance use**,** and depressive symptoms for the participants. Daily fruit and vegetable consumption was reported by 21.7% and 22.4% of respondents respectively, with the girls being significantly more likely to eat fruits and vegetables than the boys ($p < .005$). The proportion of the sample that consumed daily sweets was 13.2%, daily soft drinks was 12.3%, and daily energy drinks was 4.5%. We did not find any gender differences between the consumption of sweets ($p = 0.67$), soft drinks ($p = 0.20$), and energy drinks ($p = 0.71$). 35.5% of the sample was reported having breakfast every school day during the 'stay-at-home' era. On the weekends, the proportion that reported having breakfast on both days rises to 68.1%. There were no gender differences in having breakfast on weekdays ($p = 0.18$) and weekends ($p = 0.41$) as well.

A total of 99 (14.0%) students were not engaged in any physical activity during the mandatory confinement. 27.7% exercised at least one hour on one or two days a week. Over one in three of the participants did some physical activity for at least one hour on three or four days per week (36.7%). 15.0% of them did at least an hour of training in five or six days. Only 6.5% of the sample exercised at least one hour daily. Gender differences in physical activity showed that boys had significantly more days of participating in any physical activity for at least an hour ($p < .005$). We asked the participants about their screen time: 86.1% of them spent four or more hours on screen (e.g., tablets, PC, etc.) in the 'stay-at-home' period. Gender differences were found in screen time: the girls spent significantly more time in front of the screen than boys ($p < .005$).

The frequencies of substance use showed that 80.1% of the sample did not smoke during the 'stay-at-home' period. However, 19.9% reported that they smoked occasionally or daily. More than half of the students (58.6%) did not drink any alcohol, but 41.4% of the participants reported daily or occasional alcohol consumption. Most of the participants (97.0%) did not use any illegal drugs (e.g., marijuana). *Significant gender differences were found only in illegal drug use in our sample.* The boys were significantly more likely to report illegal drug use in the 'stay-at-home' period than girls ($p < .005$).

Finally, in terms of depressive symptoms, more than half of the sample reported a low risk of depression (54.6%), and 45.4% of the adolescents belonged to the high-risk group exhibiting depressive symptoms. Significant gender differences appeared in the risk of depressive symptoms, as well: girls were more likely to belong to the high-risk group ($p < .005$).

Table 1
The sample characteristics of eating behavior, physical activity, sedentary behavior, substance use and depressive symptoms in the 'stay-home' period

Variable	*Total (n = 705)*	*Boys (n = 264)*	*Girls (n = 441)*	*p-value*
Daily fruit consumption during the 'stay-home' period				< .005
Yes	21.7% (n = 153)	17.8% (n = 47)	24.0% (n = 106)	
No	78.3% (n = 552)	82.% (n = 217)	76.0% (n = 335)	
Daily vegetable consumption during the 'stay-home' period				< .005
Yes	21.4% (n = 151)	17.0% (n = 45)	24.0% (n = 106)	
No	78.6% (n = 554)	83.0% (n = 219)	76.0% (n = 335)	
Daily sweets consumption during the 'stay-home' period				0.67
Yes	13.2% (n = 93)	12.5% (n = 33)	13.6% (n = 60)	
No	86.8% (n = 612)	87.5% (n = 231)	86.4% (n = 381)	
Daily soft drink consumption during the 'stay-home' period				0.20
Yes	12.3% (n = 87)	14.3% (n = 38)	11.1% (n = 49)	
No	87.7% (n = 618)	85.6% (n = 226)	88.9% (n = 392)	
Daily energy drink consumption during the 'stay-home' period				0.71
Yes	4.5% (n = 32)	4.1% (n = 11)	4.8% (n = 21)	
No	95.5% (n = 705)	95.% (n = 264)	95.2% (n = 441)	
Daily breakfast on weekdays during 'stay-home' period				0.18
Yes	35.5% (n = 250)	41.3% (n = 109)	32.0% (n = 141)	
No	65.5% (n = 455)	58.7% (n = 155)	68.0% (n = 300)	
Daily breakfast at the weekends during 'stay-home' period				0.41
Yes	68.1% (n = 480)	72.7% (n = 192)	65.3% (n = 288)	
No	31.9% (n = 225)	27.3% (n = 72)	34.7% (n = 153)	
Physical activity during the 'stay-home' period				< .001
None	14.0% (n = 99)	13.6% (n = 36)	14.3% (n = 63)	

1–2 days	27.7% (n = 195)	22.7% (n = 60)	30.6% (n = 135)	
3–4 days	36.7% (n = 259)	34.1% (n = 90)	38.3% (n = 169)	
5–6 days	15.0% (n = 106)	18.9% (n = 50)	12.7% (n = 56)	
7 days a week	6.5% (n = 46)	10.6% (n = 28)	4.1% (n = 18)	
Screen time during the 'stay-home' period				< .001
Less than 1 hour	4.1% (n = 29)	6.8% (n = 18)	2.5% (n = 11)	
2–3 hour	9.8% (n = 69)	14.4% (n = 38)	7.0% (n = 31)	
4 or more hour	86.1% (n = 607)	78.8% (n = 208)	90.5% (n = 399)	
Tobacco smoking during the 'stay-home' period				0.61
Never	80.1% (n = 565)	79.3% (n = 209)	80.7% (n = 356)	
Occasionally/daily	19.9% (n = 140)	21.7% (n = 55)	19.3% (n = 121)	
Alcohol consumption during the 'stay-home' period				0.29
Never	58.6% (n = 413)	56.1% (n = 148)	60.1% (n = 265)	
Occasionally/daily	41.4% (n = 292)	43.9% (n = 116)	39.9% (n = 176)	
Drug abuse during the 'stay-home' period				< .05
Never	97.0% (n = 684)	95.1% (n = 251)	98.2% (n = 433)	
Occasionally/daily	3.0% (n = 21)	5.0% (n = 13)	1.9% (n = 9)	
Depressive symptoms during the 'stay-home' period				< .001
Low risk of depression	54.6% (n = 383)	69.2% (n = 184)	45.5% (n = 199)	
High risk of depression	45.4% (n = 318)	30.3% (n = 80)	54.5% (n = 238)	

Note. Chi-square tests.

Table 2 presents the results of the binary logistic regression analysis on the high risk of depression by sociodemographics. Girls had a significantly higher risk for depressive symptoms than boys (OR, 4.20 [95% CI, 2.94–6.01]). Depressive symptoms were also associated with the place of residence during the 'stay-at-home' period. Participants who lived in bigger cities (> 100,000 inhabitants) had a 1.75 odds ratio (95% CI, 1.03–2.96) in having a higher risk of depressive symptoms compared to those who resided in rural places.

Table 2
Odds of high risk of depression by sociodemographics in the 'stay-home' period

Variable		*OR (95% CI)*	*P-value*
Gender			
	Boy	1 (reference)	
	Girl	4.20 (2.94–6.01)	<.001
Age			
	14–15	1 (reference)	
	16–17	0.93 (0.64–1.24)	0.70
	18–19	0.75 (0.42–1.37)	0.36
Living with both parents			
	Yes	1 (reference)	
	No	1.08 (0.70–1.58)	0.69
Living in family house			
	Yes	1 (reference)	
	No	1.10(0.68–1.79)	0.68
Place of residence			
	Rural	1 (reference)	
	≤100000 city	1.52 (0.76–3.03)	0.23
	>100000 city	1.75 (1.03–2.96)	<.005
	Capital	1.53 (0.96–2.46)	0.06
Financial status			
	Upper-class	1 (reference)	
	Upper-middle-class	1.56 (0.38–6.42)	0.53
	Middle-class	1.85 (0.46–7.35)	0.37
	Lower middle-class	1.05 (0.23–4.48)	0.94
	Lower	0.74 (0.08–6.17)	0.78

Positive COVID test			
	No	1 (reference)	
	Yes	0.93 (0.39–2.13)	0.90

Note. Binary logistic regression analysis. OR: Odds Ratio 95% CI: 95% Confidence Intervals.

Table 3 shows the odds involving the high risk of depression by health behaviors. Students who never participated in physical activities had a significantly higher risk for depression compared to those who exercised daily (OR, 3.10 [95% CI, 1.45–6.65]). One to 2 days (OR, 2.55 [95% CI, 1.30–5.00]) and 3–4 days (OR, 2.10 [95% CI, 1.09–4.03]) of physical activity has also increased the odds of the high risk for depression compared to those who exercised daily. More hours of daily screen time were associated with high depression symptoms (OR, 2.27 [95% CI, 1.14–4.61]).

Table 3
Odds of high risk of depression by eating behavior, physical activity and sedentary behavior in the 'stay-home' period

Variable		*OR (95% CI)*	*P-value*
Daily fruit consumption			
	Yes	1 (reference)	
	No	1.08 (0.62–1.63)	0.97
Daily vegetable consumption			
	Yes	1 (reference)	
	No	1.10 (0.63–1.67)	0.89
Daily sweets consumption			
	Yes	1 (reference)	
	No	1.02 (0.60–1.74)	0.93
Daily soft drink consumption			
	Yes	1 (reference)	
	No	1.30 (0.75–1.24)	0.30
Daily energy drink consumption			

	Yes	1 (reference)	
	No	1.36 (0.62–2.98)	0.42
Daily breakfast			
	Yes	1 (reference)	
	No	1.16 (0.68–2.01)	0.42
Breakfast at the weekends			
	Yes	1 (reference)	
	No	1.21 (0.84–1.70)	0.29
Physical Activity			
	7 days a week	1 (reference)	
	5–6 days	1.70 (0.83–3.47)	.14
	3–4 days	2.10 (1.09–4.03)	<.05
	1–2 days	2.55 (1.30–5.00)	<.05
	none	3.10 (1.45–6.65)	<.05
Screen time			
	Less than 1 hour	1 (reference)	
	2–3 hours	1.72 (0.87–3.40)	0.11
	4 or more hours	2.27 (1.14–4.61)	<.05

Note. Binary logistic regression analysis. OR: Odds Ratio 95% CI: 95% Confidence Intervals.

Finally, in terms of substance use, occasional and daily alcohol consumption (OR, 1.98 [95% CI, 1.41–2.78]) and drug use (OR, 4.97 [95% CI, 1.40–17.53]) increased the risk of high depressive symptoms (*Table 4*).

Table 4
Odds of high risk of depression by substance use in the 'stay-home' period

Variable		*OR (95% CI)*	*P-value*
Tobacco smoking			
	Never	1 (reference)	
	Occasionally/daily	1.17 (0.76–1.80)	0.45

Alcohol consumption			
	Never	1 (reference)	
	Occasionally/daily	1.98 (1.41–2.78)	<.001
Drug abuse			
	Never	1 (reference)	
	Occasionally/daily	4.97 (1.40–17.53)	<.05

Note. Binary logistic regression analysis. OR: Odds Ratio. 95% CI: 95% Confidence Intervals.

4. Discussion

This study aimed to explore health behavior and identify the role of sociodemographics, eating behavior, physical activity, sedentary behavior, and substance use regarding depressive symptoms in Hungarian adolescents during the COVID-19 pandemic. The data were collected in the pandemic's second wave while the students were spending more than half of the year in remote study. Therefore, we aimed to detect their eating habits, physical activities, sedentary behavior, substance use and depressive symptoms during this difficult period. In particular, we wanted to explore the role health behaviors may play in the risk of developing depressive symptoms since the likelihood of developing depressive symptoms is often increased in such challenging situations (Bhatia & Bhatia 2007).

Risk assessment in adolescence has been well established (e.g., Van Voorhees et al. 2008). In our results, depressive symptoms were associated with gender, place of residence, physical activity, screen time**,** and substance use. Our findings on gender differences were consistent with previous epidemiological studies that girls were at higher risk of depression than boys (e.g., Pieh et al. 2020; Wang et al. 2020). In terms of other sociodemographic predictors of depression, only the place of residence was significantly associated with a high risk of depressive symptoms in our study. Previous researchers showed a higher risk for depression in urban areas (Vigod et al. 2013). Our results reflected this phenomenon; however, our findings were less consistent. As it seems, living in smaller cities or rural places is a protective factor against depression. While cities with more than 100,000 inhabitants significantly increased depression, living in the capital (more than two million inhabitants) was not reported as a significant predictor for high depressive symptoms. Empirical evidence exists regarding the effects of urbanization on depression; however, studies suggest that income has a mediating role on the association between place and depression (Sampson et al. 2020). Since the capital is the financial center of Hungary, most high-income families live here, which might provide protection against depressive symptoms.

Eating habits and daily breakfast consumption were not significant predictors of the high risk of depressive symptoms in our sample. On the contrary, healthy eating

habits (e.g., eating more fruits and vegetables) were associated with depression in previous studies (Lee & Allen 2021). One of the main benefits of remote schooling was the decrease in sweet beverages and energy-dense food consumption (Inchley et al. 2020; Németh 2014). It is a welcome result since the consumption of sweets and sweetened beverages has been associated with obesity and cardiovascular risk (Kavey 2010). However, we should acknowledge that fruit and vegetable consumption was lower in our sample than in previous studies (Inchley et al. 2020). These results are consistent with findings from the international literature about pandemic eating habits, where researchers found unhealthy eating patterns (e.g., Ammar et al. 2020). This means that while consuming more fruits and vegetables remains essential for young people's mental health (Lee & Allen 2021), fruit and vegetable consumption did not prove to be protective factors in our study. Although girls had a healthier eating profile than boys, consuming significantly more fruits and vegetables in our research, they were more likely to have high depressive symptoms. Other studies found that meal routine (e.g., meal preparation, making more meals) was changed during the pandemic period. This can have an impact on dietary habits, which we did not measure. This change might also affect the risk of depressive symptoms in the 'stay-at-home' period (Carroll et al. 2020). Future studies should address this phenomenon.

The role of physical activity is particularly relevant for mental health and depression (VanKim & Nelson 2013). We found significant associations between physical activity, sedentary behavior, and the risk of depression, similar to previous research (e.g., Feng et al. 2014; Taylor 2011). It seems that the risk of depression is increasing while willingness to exercise is decreasing in our study. As mentioned earlier, a global reduction of physical activity has impacted both adults and adolescents (i.e., Bates et al. 2020; Chen et al. 2020). This is true in our study as well; only a small part of our sample participated in daily physical activity (6.5%) during the lockdown. In comparison, daily physical activity stood at 16% in the HBSC research in 2018 (Inchley et al. 2020). During this period, not only was in-school physical education suspended, but the training for several sports were also canceled. Taken together, these further reduced the opportunity and motivation to participate in sports for the adolescent population. Previous studies showed the importance of social interaction in sport motivation (Orr et al. 2018), which this period rendered impossible. With a decreased physical activity, screen time significantly increased compared with previous studies (Németh 2014) since the students often sat in front of their computers all day. This result was expected, and similar trends were shown in previous research. Stiglic and Viner (2019) found higher depressive symptoms and lower levels of quality of life among adolescents who spend more time in front of a TV or a computer. Our results suggest that home-schooling might contribute to a deterioration of adolescent mental health.

Alcohol consumption and drug use increased the odds for the high risk of depressive symptoms in our study. This result was not unexpected since the students could not meet with their friends, many leisure activities were canceled, and the 'stay-at-home' orders turned their lives upside down. As mentioned earlier, the lack of social interaction could lead to increased substance use associated with mental health issues such as depression (Fairbairn & Sayette 2014). Furthermore, it is plausible that adolescents had more unstructured time**,** which can be associated with problem behavior, including substance use (Dumas et al. 2020). Even though alcohol consumption and drug use increased the risk of depression, use was still lower compared to the HBSC study in 2018 (Inchley et al. 2020). Alcohol consumption in their research was 51%, and in our research, 41% of the participants reported drinking during the 'stay-at-home' period. Drug use was also reported as lower compared to the HBSC results (Inchley et al. 2020; Németh 2014). We assume that access to such substances was harder during the lockdown (Chiappini et al. 2020). Interestingly, smoking was not a predictor of the high risk of depression. There is a declining trend in tobacco usage**,** which might explain our result. For example, according to the HBSC study in 2014, 32% of adolescent boys (28% of the girls) smoked in their last 30 days. This result was decreased in the HBSC study in 2018 to 25% (21% of the girls) (Inchley et al. 2020). In our study, 21% of the boys and 19% of the girls reported tobacco use in the 'stay-at-home' period.

5. Conclusions

In conclusion, our study's most important findings are the following: 1) Girls had a higher probability of depressive symptoms than boys in the 'stay-at-home' regime; 2) Physical activity appears to have had a protective role against a high risk of developing depressive symptoms; 3) Screen time, alcohol consumption and drug abuse were associated with an increased risk of depressive symptoms. Furthermore, we believe our results suggest that the increased screen time during the 'stay-at-home' era, the lack of daily physical activity and the use of alcohol and illegal drugs may be associated with loneliness and they might have contributed to depressive symptoms. Further research is needed to detect these associations.

Our study has limitations that need addressing: First, due to the convenience sample, the generalizability of our results may be restricted. Second, the method of data collection, namely, social media platforms, may narrow down the participation. We must also acknowledge that our research was based on cross-sectional data. Thus, causal interpretation is not possible. For example, alcohol or other substances are often used as a way of self-medicating for depression. The measurement of sedentary behavior was also a limitation since questions about screen time were developed for non-pandemic times, hence our result might not have a high reliability. Another

limitation of our study is the date of the data collection. According to Tucker and Gilliland (2007), levels of physical activity vary with seasonality. Therefore, our data collection in winter may contribute to the low level of physical activity. Finally, without a clinical diagnosis, we cannot interpret our results in terms of depression, only the risk of depressive symptoms. Future research should address longitudinal design and examine changes over time to better understand the impact of the COVID-19 pandemic on adolescent behavior and mental health. Furthermore, future studies should focus on other aspects of health behavior and depression. For example, it would be interesting to see how meal routine changes such as eating more meals may affect depressive symptoms. Other psychological variables can also be used in the future (e.g., loneliness). All in all, we believe our analysis provided useful information on adolescent health behaviors and the role these might play in the risk of depressive symptoms. We hope these results help professionals develop programs or regulations for future pandemics and lockdowns**,** which might help support adolescents' mental wellbeing in similar unusual circumstances.

References

Ács, P., V. Prémusz, K. Morvay-Sey, Á. Pálvolgyi, M. Trpkovici, G. Elbert, C. MElczer & A. Makai (2020) 'Effects of Covid-19 on Physical Activity Behavior Among University Students: Results of a Hungarian Online Survey', *Health Problems of Civilization* 14(3), 174–82 (https://doi.org/10.5114/hpc.2020.98472).

Ammar, A., M. Brach, K. Trabelsi, H. Chtourou, O. Boukhris, L. Masmoudi, B. Bouaziz, E. Bentlage, D. How, M. Ahmed, P. Mueller, N. Mueller, A. Aloui, O. Hammouda, L.L. Paineiras-Domingos, A. Braakman-jansen, C. Wrede, S. Bastoni, C. Soares Pernambuco, L. Mataruna, M. Taheri, K. Irandoust, A. Khacharem, N.L. Bragazzi, K. Chamari, J.M. Glenn, N.T. Bott, F.Gargouri, L. Chaari, H. Batatia, G.M. Ali, O. Abdelkarim, M. Jarraya, K. El Abed, N. Souissi, L.Van Gemert-Pijnen, B.L. Riemann, L. Riemann, W. Moalla, J. Gómez-Raja, M. Epstein, R. Sanderman, S. Schulz, A. Jerg, R. Al-Horani, T. Mansi, M. Jmail, F. Barbosa, F.Santos, B. Šimunič, R. Pišot, D. Cowan, A. Gaggioli, S.J. Bailey, J. Steinacker, T. Driss & A. Hoekelman (2020) 'Effects of COVID-19 Home Confinement on Physical Activity and Eating Behaviour Preliminary Results of the ECLB-COVID19 International Online-Survey', *Nutrients* 12(6), 1583 (https://doi.org/10.1101/2020.05.04.20072447).

Aoun, C., L. Nassar, S. Soumi, N. El Osta, T. Papazian & L. Rabbaa Khabbaz (2019) 'The Cognitive, Behavioral, and Emotional Aspects of Eating Habits and Association with Impulsivity, Chronotype, Anxiety, and Depression: A

Cross-Sectional Study', *Frontiers in Behavioral Neuroscience* 13, 204 (https://doi.org/10.3389/fnbeh.2019.00204).

Assari, S. (2017) 'Social Determinants of Depression: The Intersections of Race, Gender, and Socioeconomic Status', *Brain Sciences* 7(12), 156 (https://doi.org/10.3390/brainsci7120156).

Bates, L.C., G. Zieff, K. Stanford, J.B. Moore, Z.Y. Kerr, E.D. Hanson, B.B. Gibbs, C.E. Kline & L. Stoner (2020) 'COVID-19 Impact on Behaviors Across the 24-Hour Day in Children and Adolescents: Physical Activity, Sedentary Behavior, and Sleep', *Children* 7(9), 138 (https://doi.org/10.3390/children7090138).

Behrouz, R. & R.V. Aachi (2017) 'Letter by Behrouz and Aachi Regarding Article, "Cannabis, Tobacco, Alcohol Use, and the Risk of Early Stroke: A Population-Based Cohort Study of 45 000 Swedish Men"', *Stroke* 48(5), e133 (https://doi.org/10.1161/strokeaha.117.016872).

Bhatia, S.K. & S.C. Bhatia (2007) 'Childhood and Adolescent Depression', *American Family Physician* 75(1), 73–80, retrieved 11 Oct 2021 from https://www.aafp.org/afp/2007/0101/p73.html.

Bobakova, D., Z. Hamrik, P. Badura, D. Sigmundova, H. Nalecz & M. Kalman (2015) 'Test–Retest Reliability of Selected Physical Activity and Sedentary Behaviour HBSC Items in the Czech Republic, Slovakia and Poland', *International Journal of Public Health* 60, 59–67 (https://doi.org/10.1007/s00038-014-0628-9).

Canham, S.L., P.M. Mauro, C.N. Kaufmann & A. Sixsmith (2016) 'Association of Alcohol Use and Loneliness Frequency Among Middle-Aged and Older Adult Drinkers', *Journal of Aging and Health* 28(2), 267–84 (https://doi.org/10.1177/0898264315589579).

Carroll, N., A. Sadowski, A. Laila, V. Hruska, M. Nixon, D.W.L. Ma & J. Haines (2020) 'The Impact of COVID-19 on Health Behavior, Stress, Financial, and Food Security among Middle to High Income Canadian Families with Young Children', *Nutrients* 12(8), 2352 (https://doi.org/10.3390/nu12082352).

Chiappini, S., A. Guirguis, A. John, J.M. Corkery & F. Schifano (2020) 'COVID-19: The Hidden Impact on Mental Health and Drug Addiction', *Frontiers in Psychiatry* 11, 767 (https://doi.org/10.3389/fpsyt.2020.00767).

Chen, P., L. Mao, G.P. Nassis, P. Harmer, B.E. Ainsworth & F. Li (2020) 'Returning Chinese School-Aged Children and Adolescents to Physical Activity in the Wake of COVID-19: Actions and Precautions', *Journal of Sport and Health Science* 9(4), 322–24 (https://doi.org/10.1016/j.jshs.2020.04.003).

Czeisler, M.É., R.I. Lane, E. Petrosky, J.F. Wiley, A. Christensen, R. Njai, M.D. Weaver, R. Robbins, E.R. Facer-Childs, L.K. Barger, C.A. Czeisler, M.E. Howard & S.M.W. Rajaratnam (2020) 'Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 pandemic — United States, June 24–30, 2020', *MMWR Morbidity and Mortality Weekly Report* 69, 1049–57 (https://doi.org/10.15585/mmwr.mm6932a1).

Duan, L., X. Shao, Y. Wang, Y. Huang, J. Miao, X. Yang & G. Zhu (2020) 'An Investigation of Mental Health Status of Children and Adolescents in China During the Outbreak of COVID-19', *Journal of Affective Disorders* 275, 112–18 (https://doi.org/10.1016/j.jad.2020.06.029).

Dumas, T.M., W. Ellis & D.M. Litt (2020) 'What Does Adolescent Substance Use Look Like During the COVID-19 Pandemic? Examining Changes in Frequency, Social Contexts, and Pandemic-Related Predictors', *Journal of Adolescent Health* 67(3), 354–61 (https://doi.org/10.1016/j.jadohealth.2020.06.018).

Dyal, S.R. & T.W. Valente (2015) 'A Systematic Review of Loneliness and Smoking: Small Effects, Big Implications', *Substance Use & Misuse* 50(13), 1697–1716 (https:/doi.org/10.3109/10826084.2015.1027933).

Fairbairn, C.E. & M.A. Sayette (2014) 'A Social-Attributional Analysis of Alcohol Response', *Psychological Bulletin* 140(5), 1361–82 (https://doi.org/10.1037/a0037563).

Feng, Q., Q. Zhang, Y. Du, Y. Ye & Q. He (2014) 'Associations of Physical Activity, Screen Time with Depression, Anxiety and Sleep Quality Among Chinese College Freshmen', *PLoS ONE* 9(6), e100914 (https://doi.org/10.1371/journal.pone.0100914).

Harakeh, Z., M.E. de Looze, C. Schrijvers, S.A.F.M. van Dorsselaer & W.A.M. Vollebergh (2012) 'Individual and Environmental Predictors of Health Risk Behaviours Among Dutch Adolescents: The HBSC Study', *Public Health* 126(7), 566–73 (https://doi.org/10.1016/j.puhe.2012.04.006).

Hawkley, L.C. & J.T. Cacioppo (2010) 'Loneliness Matters: A Theoretical and Empirical Review of Consequences and Mechanisms', *Annals of Behavioral Medicine* 40, 218–27 (https://doi.org/10.1007/s12160-010-9210-8).

Hodder, R.K., M. Freund, J. Bowman, L. Wolfenden, K. Gillham, J. Dray & J. Wiggers (2016) 'Associations Between Adolescent Tobacco and Alcohol Use, and Tobacco and Alcohol Use Risk and Protective Factors', *BMJ Open* 6, e012688 (https://doi.org/10.1136/bmjopen-2016-012688).

Inchley, J., D. Currie, S. Budisavljevic, T. Torsheim, A. Jåstad, A. Cosma, C. Kelly, Á.M. Arnarsson & O. Samdal eds., (2020) *Spotlight on Adolescent Health and Well-Being: Findings from the 2017/2018 Health Behaviour in School-Aged Children (HBSC) Survey in Europe and Canada; International Report; Volume 2. Key Data* (Copenhagen: WHO) retrieved 8 Oct 2021 from https://www.euro.who.int/en/publications/abstracts/spotlight-on-adolescent-health-and-well-being.-findings-from-the-20172018-health-behavior-in-school-aged-children-hbsc-survey-in-europe-and-canada.-international-report.-volume-2.-key-data.

Jiao, V.Y., L.N. Wang, H. Liu, S.F. Fang, F.Y. Jiao, M. Pettoello-Mantovani & E. Somekh (2020) 'Behavioral and Emotional Disorders in Children During the COVID-19 Epidemic', *Pediatric Pharmacology* 17(3), 230–33 (https://doi.org/10.15690/pf.v17i3.2127).

Kavey, R.-E.W. (2010) 'How Sweet it Is: Sugar-Sweetened Beverage Consumption, Obesity, and Cardiovascular Risk in Childhood', *Journal of the American Dietetic Association* 110(10), 1456–60 (https://doi.org/10.1016/j.jada.2010.07.028).

Kovacs, V.A., G. Starc, M. Brandes, M. Kaj, R. Blagus, B. Leskošek, T. Suesse, E. Dinya, B.C. Guinhouya, V. Zito, P.M. Rocha, B.P. Gonzalez, A. Kontsevaya, M. Brzezinski, R. Bidiugan, A. Király, T. Csányi & A.D. Okely (2021) 'Physical Activity, Screen Time and the COVID-19 School Closures in Europe – An Observational Study in 10 Countries', *European Journal of Sport Science* 1–10 (https://doi.org/10.1080/17461391.2021.1897166).

Költő, A. (2014) 'Szubjektív jóllét és egészségi állapot' [Subjective well-being and mental health], in A. Németh & A. Költő, eds., *Egészség és egészségmagatartás iskoláskorban 2014: Az Iskoláskorú gyermekek egészségmagatartása elnevezésű, az Egészségügyi Világszervezettel együttműködésben megvalósuló nemzetközi kutatás 2014. évi felméréséről készült nemzeti jelentés* [Health Behaviour in School-aged Children (HBSC): A WHO-collaborative Cross-National Study National Report] 132–49, retrieved 10 Oct 2021 from https://mek.oszk.hu/16100/16119/16119.pdf.

Lee, J. & J. Allen (2021) 'Gender Differences in Healthy and Unhealthy Food Consumption and its Relationship with Depression in Young Adulthood', *Community Mental Health Journal* 57, 898 – 909 (https://doi.org/10.1007/s10597-020-00672-x).

López-Bueno, R., G.F. López-Sánchez, J.A. Casajús, J. Calatayud, A. Gil-Salmerón, I. Grabovac, M.A. Tully & L. Smith (2020) 'Health-Related Behaviors Among School-Aged Children and Adolescents During the Spanish COVID-19 Confinement', *Frontiers in Pediatrics* 8 (https://doi.org/10.3389/fped.2020.00573).

Monostori, J. (2021) *The School Year 2020–2021 In Hungary During the Pandemic - Country Report* (Luxembourg: Publications Office of the European Union).

Morvai-Sey, K., Á. Pálvölgyi, V. Prémusz, P. Ács, M. Stocker, A. Makai, C. Melczer, T. Laczkó, A. Szentei & D. Paár (2020) 'A COVID-19 kijárási korlátozás első hullámának hatása a magyar felnőtt lakosság szubjektív pszichés mutatóira, jóllétére, fizikai aktivitására és sportolási szokásaira' [The impact of the first wave of the COVID-19 restriction on the mental well-being, physical activity among Hungarian adults] in M. Antal & R. Pilling, eds., *A magyar lakosság életmódja járványhelyzet idején: táplálkozás, testmozgás és lélek* [The lifestyle of the Hungarian population during the pandemic: Nutrition, Exercise and Mind] (Budapest: Táplálkozás, Életmód és Testmozgás Platform Egyesület) 80–87, retrieved 10 Oct 2021 from https://tetplatform.hu/wp-content/uploads/2020/12/Koronavirus_es_eletmod_TET_Platform_feher_konyv.pdf.

Németh, A. (2014) 'Táplálkozási szokások és fogápolás' [Eating habits and dental care] in A- Németh & A. Költő, eds., *Egészség és egészségmagatartás is-*

koláskorban 2014: Az Iskoláskorú gyermekek egészségmagatartása elnevezésű, az Egészségügyi Világszervezettel együttműködésben megvalósuló nemzetközi kutatás 2014. évi felméréséről készült nemzeti jelentés [Health Behaviour in School-aged Children (HBSC): A WHO-collaborative Cross-National Study National Report] 18–30, retrieved 10 Oct 2021 from https://mek.oszk.hu/16100/16119/16119.pdf.

Orr, K., K.A. Tamminen, S.N. Sweet, J.R. Tomasone & K.P. Arbour-Nicitopoulos (2018) ' "I've Had Bad Experiences with Team Sport": Sport Participation, Peer Need-Thwarting, and Need-Supporting Behaviors Among Youth Identifying with Physical Disability', *Adapted Physical Activity Quarterly* 35(1), 36–56 (https://doi.org/10.1123/apaq.2017-0028).

Pappa, S., V. Ntella, T. Giannakas, V.G. Giannakoulis, E. Papoutsi & P. Katsaounou (2020) 'Prevalence of Depression, Anxiety, and Insomnia among Healthcare Workers During the COVID-19 Pandemic: A Systematic Review and Meta-Analysis', *Brain, Behavior, and Immunity* 88, 901–907 (https://doi.org/10.1016/j.bbi.2020.05.026).

Patanavanich, R., & S.A. Glantz (2020) 'Smoking is Associated with COVID-19 Progression: A Meta-Analysis', *Nicotine & Tobacco Research* 22(9), 1653–56 (https://doi.org/10.1101/2020.04.13.20063669).

Pieh, C., S. Budimir & T. Probst (2020) 'The Effect of Age, Gender, Income, Work, and Physical Activity on Mental Health During Coronavirus Disease (COVID-19) Lockdown in Austria', *Journal of Psychosomatic Research* 136, 110186 (https://doi.org/10.1016/j.jpsychores.2020.110186).

Ran, L., W. Wang, M. Ai, Y. Kong, J. Chen & L. Kuang, L. (2020) 'Psychological Resilience, Depression, Anxiety, and Somatization Symptoms in Response to COVID-19: A Study of the General Population in China at the Peak of its Epidemic', *Social Science & Medicine* 262, 113261 (https://doi.org/10.1016/j.socscimed.2020.113261).

Sampson, L., C.K. Ettman & S. Galea (2020) 'Urbanization, Urbanicity, and Depression: A Review of the Recent Global Literature', *Current Opinion in Psychiatry* 33(3)*,* 233–44 (https://doi.org/10.1097/yco.0000000000000588).

Sidor, A. & P. Rzymski (2020) 'Dietary Choices and Habits During COVID-19 Lockdown: Experience from Poland', *Nutrients* 12(6), 1657 (https://doi.org/10.3390/nu12061657).

Stiglic, N. & R.M. Viner (2019) 'Effects of Screentime on the Health and Well-Being of Children and Adolescents: A Systematic Review of Reviews', *BMJ Open* 9(1), e023191 (https://doi.org/10.1136/bmjopen-2018-023191).

Taylor, O.D. (2011) 'Adolescent Depression as a Contributing Factor to the Development of Substance Use Disorders', *Journal of Human Behavior in the Social Environment* 21(6), 696–710 (https://doi.org/10.1080/10911359.2011.583519).

Tucker, P. & J. Gilliland (2007) 'The Effect of Season and Weather on Physical Activity: A Systematic Review', *Public Health* 121(12), 909–22 (https://doi.org/10.1016/j.puhe.2007.04.009).

VanKim, N.A. & T.F. Nelson (2013) 'Vigorous Physical Activity, Mental Health, Perceived Stress, and Socializing Among College Students', *American Journal of Health Promotion* 28(1)*,* 7–15 (https://doi.org/10.4278/ajhp.111101-quan-395).

Van Voorhees, B.W., D. Paunesku, J. Gollan, S. Kuwabara, M. Reinecke & A. Basu (2008) 'Predicting Future Risk of Depressive Episode in Adolescents: The Chicago Adolescent Depression Risk Assessment (CADRA)', *The Annals of Family Medicine* 6(6), 503–11 (https://doi.org/10.1370/afm.887).

Vigod, S.N., L.A. Tarasoff, B. Bryja, C.-L. Dennis, M.H. Yudin & L.E. Ross (2013) 'Relation Between Place of Residence and Postpartum Depression', *Canadian Medical Association Journal* 185(3), 1129–35 (https://doi.org/10.1503/cmaj.122028).

Wang, X., S. Hegde, C. Son, B. Keller, A. Smith & F. Sasangohar (2020) 'Investigating Mental Health of US College Students During the COVID-19 Pandemic: Cross-Sectional Survey Study', *Journal of Medical Internet Research* 22(9), e22817 (https://doi.org/10.2196/22817).

WHO (2013) *Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020* (Geneva: World Health Organization) retrieved 11 Oct 2021 from https://apps.who.int/iris/bitstream/handle/10665/94384/9789241506236_eng.pdf?sequence=1&isAllowed=y.

Zhou, J., X. Yuan, H. Qi, R. Liu, Y. Li, H. Huang, X. Chen & G. Wang (2020) 'Prevalence of Depression and its Correlative Factors among Female Adolescents in China During the Coronavirus Disease 2019 Outbreak', *Globalization and Health* 16, 69 (https://doi.org/10.1186/s12992-020-00601-3).

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HEALTH ACCEPTANCE THROUGH CAMP

Mixed-Method Data from a Central-European Therapeutic Recreational Based Camp for Seriously Ill Children**

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This study aims to understand how youth living with serious illness retrospectively value their therapeutic recreational (TR) based camp experience. We focus primarily on how they learned to accept their health condition, what they consider the most valuable outcome from camp, and through which mechanisms the camp contributed to these outcomes. The study applied a mixed-method online survey measuring learning outcomes retrospectively in a sample of 18–25-year-old camp alumni (N = 60) from the Hungarian 'Camp of Courage' (Bátor Tábor). Questions regarding illness acceptance and health competence formed the quantitative part and were analyzed via descriptive statistics. We assessed the most important camp outcomes with open-ended survey questions in the qualitative part, and applied a deductive thematic analysis method. Our research found that illness acceptance and health competence are important constructs for young adults, and TR-based camps may play a major role in their development. We organized recurring themes under the overarching theme 'restorative experience and growth' as the main benefit from camp and under 'unconditional acceptance' as the camp mechanism contributing to this benefit. Those campers who have experienced illness-based limitations in life before expressed most benefits in psychosocial domains. They highlighted the acceptance, empathy, and social support at camp, experienced mainly through interactions with peers and camp counselors. We may conclude

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that Camp of Courage provides a suitable environment for psychosocial rehabilitation of youth affected by childhood cancer or other serious illness. We recommend further research on the roles of illness acceptance and social interactions at camp.

Keywords: Therapeutic Recreation; summer camp; illness acceptance; young adults; serious illness; tertiary prevention

1. Background

The present study aims to explore how young adults living with serious illness retrospectively evaluate childhood summer camps' role in their current adult life. We hope to offer a better understanding of the long-term subjective benefits of therapeutic recreational camps. Chronic health conditions, like diabetes, heart disease, cancer, stroke, chronic respiratory problems, HIV/AIDS, blindness or deafness, among others, are either incurable conditions or require prolonged treatment and care, with pervasive uncertainty (WHO et al. 2014). Chronic illness widely affects youth in Hungary, almost one-third of Hungarian adolescents are dealing with some kind of chronic health problem (Németh & Várnai 2019). Childhood cancer survivor rates are increasing up to 80% in Hungary thanks to advances in medical treatment (Jakab & Garami 2018), although Oeffinger and colleagues (2006) found that by the age of 25–26, youth with a history of childhood cancer are 3.3 times more likely to have at least one chronic illness than their siblings.

Growing into adulthood with the burden of an illness puts youth in front of certain challenges besides the normal developmental crises of this age. Exploring one's identity, finding independence, choosing a career direction, gaining life experience, and forming stable and supportive relationships are challenging for any adolescent, and youth with serious illnesses have to cope with several missed or delayed important developmental milestones due to hospitalizations and treatments (Stam et al. 2006; Williams et al. 2002). Kearney (2009) suggests that childhood cancer survivors are remarkably conservative as young adults, they may have a less active social life (Larcombe et al. 2002) and face deficits in friendships and love/sexual relationships (Mackie et al. 2000). Experiences with chronic illness may leave young people potentially lonely and vulnerable. On the other hand, having experienced several painful interventions and one's constant preoccupation with side effects or relapses may make these young people tough, resilient, and autonomous, and even post-traumatic growth can be observed (Zebrack 2011; Zsigmond & Rigó 2019).

Health-related quality of life (HRQoL) in serious illness is connected to a variety of psychosocial factors, such as self-care, identity, self-esteem, meaningful social support, and independence (Fredericks 2009; Rigó & Kökönyei 2014; Sattoe et al. 2015). Psychosocial factors are considered as playing a more dominant role in

HRQoL than physical characteristics of the specific illness (Rigó & Kökönyei 2014). Tertiary prevention programs intend to achieve and maintain a good HRQoL, they are 'aimed at softening the impact of established disease and disability', at reducing the burden of any illness, and preventing relapses or complications in the future (Nolte 2008, 222). Such programs foster an independent, socially integrated life with the active participation of the person living with illness or disability (Nolte 2008). Abilities of self-management and treatment adherence are connected to the person's belief system regarding how the illness itself is perceived and accepted, and how competent they feel about controlling their health-related behavior, thoughts, and feelings (Grady & Gough 2014). In the following section, we will discuss in more detail two related constructs which play an important role in rehabilitation: health competence and illness acceptance. Later we present our research questions on how therapeutic recreation summer camps are suitable to affect health competence and illness acceptance.

Health competence is considered to be a health-related self-efficacy and contributes to better general life satisfaction (Smith et al. 1995). Albert Bandura introduced the construct of self-efficacy, basing it on his social-cognitive theory and applying it to a person's belief in their ability to succeed in a particular situation (Bandura 1997). Health competence aims to capture the perceived ability to control one's health, implying that stronger perceived personal control in life is associated with better health outcomes and better health behavior (Smith et al. 1995).

Several factors modulate the complex process of illness acceptance, such as individual predispositions (e.g., temperament, emotions, stress, coping strategies, etc.), support from family members and close individuals, and socioeconomic status. Acceptance of illness is not only an important determinant of HRQoL, but it decreases negative emotions associated with the chronic illness and its treatment, thus reducing the level of psychological distress (Lewko et al. 2007). A high level of illness acceptance results in better medication compliance and self-care (Obiegło et al. 2016).

Therapeutic recreation (TR) is a method of psycho-social rehabilitation and provides a series of specific leisure activities and reinforcements to address the assessed needs of individuals with illnesses and/or disabling conditions as a means to psychosocial recovery and wellbeing (American Therapeutic Recreation Association, cited by Carter & Van Andel [2019, 6]). The method has been used since the 1960s in North America to improve the physical and mental well-being of people with some limitations (Walker & Pearman 2009). The recreational elements provide sufficient motivation, experiential learning, and fun to achieve specific development goals. The four steps of this are status assessment, goal and activity planning, implementation, and evaluation (APIE) (Carter & Van Andel 2019). While the TR method has become a stand-alone profession in North America, in Europe the TR methodology is mostly adapted in seriously ill children's summer camps and uses

a slightly more liberal definition, with four stations in the interventions: challenge, success, reflection, and discovery (Hosszú 2011; Kearney 2009).

TR summer camps may be a form of tertiary prevention programs, psychosocial rehabilitation for youth living with some illness. These camps aim to create an environment for ill or disabled children where they may have fun and can experience being just kids. Apart from constant and invisible medical, dietary, and nursing supervision, a group of specifically trained camp staff provides the TR-based programs. The psychosocial benefits of TR camps' have been proven in a variety of areas, like increased hope and a positive outlook regarding their future (Rea et al. 2019), or significant positive changes regarding self-esteem, self-efficacy, and self-perception (Békési et al. 2011; Kiernan et al. 2004; Kiernan & Maclachlan 2002; Meltzer et al. 2018; Török et al. 2006), and building valuable social connections is also widely confirmed (Allsop et al. 2013; Kearney 2009; Kearney 2018; Moola et al. 2014). Less is known about these camps' long-term impact.

The Hungarian Camp of Courage (Bátor Tábor) has offered TR-based summer camps for children with cancer, juvenile idiopathic arthritis (JIA), diabetes, and several other serious illnesses since 2001. The camp hosts approximately 1,000 children living with serious illness and their family members from Hungary and the Central-Eastern European region every year at their campsite, and many more in their hospital and school outreach programs (Papp 2021). Over the last 20 years, this camp has been continuously developing its TR based program, following the model of Serious Fun Children's Network and especially the Irish Barretstown Camp (Papp 2021), about the later, see (Jennings & Guerin 2014; Kiernan et al. 2004, Kearney 2018). The APIE model is applied at Camp of Courage in a context of fun, campers are offered exciting challenges (individually adapted through informal assessment and planning), they experience success in overcoming these challenges (implementation), then reflect on their experiences guided by camp counselors (evaluation) and make discoveries about their new skills, potentials, and strengths in themselves through these processes (Papp 2021). This camp TR model of challenge-success-reflection-discovery, also described by Kiernan and Maclachlan (2002) and Kearney (2009), has a strong social element, as the reflections being facilitated by trained camp staff and peers who are present as witnesses to the success (Hosszú 2011; Hosszú & Lénárd 2015; Tóth & Hosszú 2013). One special characteristic of the Hungarian camp is that Camp of Courage operates its programs with specially trained volunteer camp counselors having diverse backgrounds in age, gender, profession, language, and nationality. Besides TR, the culturally aligned programming includes elements of wilderness therapy, outward bound programs, experiential learning, psychological reflective techniques and rites of passage, built on a physically and emotionally safe and inclusive environment (Hosszú & Lénárd 2015).

In the present mixed-method study, (1) we aimed to explore how young adults affected by serious illness (1a) perceive the importance of health-related life skills

such as the ability to accept their illness and to feel competent in their health management. We investigated (1b) how they think camp experience played a role in the development of these skills, and (1c) how any other environment played an important role in this development. Our (2) second aim was to assess (2a) the most valuable benefits that young adults with serious illnesses attribute to their camp experience. We also aimed to (2b) understand through what mechanisms the camp exerts its impact on these most valuable outcomes.

The present research is a part of the 'Youth Impact Study' conducted by the American Camp Association and the University of Utah, carried out on an international oversample in eight medical focus camps of the Serious Fun Children's Network (SFCN). The Hungarian Camp of Courage participated in the research during the summer of 2018. The Hungarian study received approval from the Regional Institutional Committee of Science and Research Ethics at Semmelweis University, Budapest (167/2018), and the Board of Camp of Courage Foundation.

2. Methods

A retrospective, convergent mixed-methods approach was used to explore the long-term effects of camp experience to understand participants' most valuable experience from a TR-based camp and how the development of health acceptance and health management are linked to camp experience.

2.1 Sample and procedure

Study participants were recruited via the alumni database of Camp of Courage Foundation. An email was sent to the former campers who met the following criteria: age 18–25, participated in Camp of Courage before as children or adolescents, are Hungarian speakers, and who consented to be contacted for research purposes when they joined the alumni group. Study participants had to meet the following criteria at the time they attended Camp of Courage: 8–18 years old, diagnosed with either one of the following: childhood cancer or leukemia, hemophilia, diabetes mellitus, juvenile idiopathic arthritis (JIA), or inflammatory bowel disease. Our sample contained youth with a heterogenic medical background. The online survey link with a brief description of the study purpose was provided to the contacts by the University of Utah, who sent the Hungarian raw data back to the authors. Information about safe data management was given, and consent was asked for participation in the international research. A reminder email was sent out two weeks after the first, and the link was closed after one month. From the 800 alumni contacts, 650 email addresses turned out to be valid, 109 participants started to fill out the survey, we obtained 63 complete answers, but three participants did not consent

to the academic use of results. A total of N = 60 complete answers remained. The sample is described in *Table 1*. The overrepresentation of women over men and a total 16% response rate was similar to what the literature suggests about online surveys (Sax et al. 2003).

Table 1
Demographic characteristics (N = 60)

Age 18-25		*M* = 20.63 (*SD* = 1.97)
Gender		
	Women	41 (68.3%)
	Men	19 (31.7%)
Demographic background		
	Urban	24 (40%)
	Rural	36 (60%)
Father's highest education		
	Lower than high school degree	26 (43.3%)
	High school degree or higher	32 (53.3%)
How many times participated in Camp Courage (n=40)		
	1–2 times:	25 (62.5%)
	3–4 times:	15 (37.5%)
Years since last participation in Camp Courage (n=39)		
	less than 5 years	18 (46.1%)
	5–11 years	21 (53.8%)

2.2. Instruments

We used a survey of 18+2 possible learning outcomes linked to camp participation designed for the 'Youth Impact Study' (see also at Richmond et al. 2019; Warner et al. 2021). 18 outcomes referred to general life skills survey questions were created by Wilson, based on previous qualitative study results (Wilson & Sibthorp 2018). The +2 possible outcomes were added only to the present Hungarian study referring to illness acceptance and perceived health competence (DeRosa et al. 2011; Felton & Revenson 1984; Lewko et al. 2007; Mazurek & Lurbiecki 2014; Smith et al. 1995), based on the decision of a team of researchers and camp experts and to be

applied to a sample of youth with serious illnesses. However, the complete Perceived Health Competence Scale and Acceptance of Illness Scale could not be included in the study because of the lack of validated Hungarian translation and the questionnaire length; therefore, the authors reduced the scales to one item each to fit into the international survey's structure. Survey questions included a retrospective, daily importance, and a setting question to all 18+2 outcomes and were followed by a set of open-ended questions (see *Table 2* for outcome list and *Table 3* for questions and examples). The Hungarian translation and adaptation of the survey were carried out at the Institute of Mental Health at Semmelweis University, Budapest. In the present study, we discuss only the results of the +2 health-related learning outcomes.

Qualitative data was gathered from a set of open-ended questions built on each other to better understand the subjective role of the camp in the current life of participants. Camp mechanisms contributing to this effect were explored (see *Table 3*).

Table 2
Camp learning outcomes and definitions

	Learning Outcome	*Definition*
1	Relationship Skills	Ability to form relationships with others
2	Teamwork	Ability to work as part of a team on a task
3	How to Live with Peers	Ability to live in close quarters with peers
4	Empathy and Compassion	Ability to empathize with others
5	Organization	Ability to be organized
6	Responsibility	Willingness to be responsible for own behaviors
7	Independence	Ability to function independently without reliance on family
8	Perseverance	Ability to persevere in the face of challenges
9	Career Orientation	Understanding of what to do for a career or in college
10	Self-Identity	Understanding of who I am and how I want to live my life
11	Emotion Regulation	Ability to control my emotions
12	Self Confidence	Confidence in abilities to be successful
13	Appreciation for Diversity	Appreciation for different people and perspectives
14	Willingness to Try New Things	Willingness to try new things

15	Living in the Moment	Appreciation for being present in the moment
16	Leadership	Ability to lead a group of peers to complete a task
17	Leisure Skills	Ability to participate in sport and/or recreation activities
18	Affinity for Nature	Appreciation for the natural world/nature
19	Illness acceptance	Ability to accept my health conditions
20	Health competence.	Ability to do something for own wellbeing

Table 3
Question forms, examples, and ratings

Retrospective questions:	Camp was critical in the development *of my acceptance of my health condition.*	Very false Very true 1 2 3 4 5 6 7 8 9 10
Importance of skill in daily life	In your daily life, how important is *your acceptance of your health condition?*	Least important Most important 1 2 3 4 5 6 7 8 9 10
Setting of the development	*In what one setting did you primarily develop your ability to accept your health condition?*	Camp, home, school, workplace, sports club, church, other
Qualitative questions: learning mechanisms at camp	Name one learning outcome from the summer camp which is the most valuable in your current life? > Why is this the most valuable? > What influenced acquisition at the camp and how? > Any environmental factor supporting or hindering learning outcome's transfer outside the camp?	

2.3. Analysis

Descriptive statistical analysis was applied in the pilot study, carried out with SPSS 25.0. Survey questions did not meet the criteria for normality (Shaphiro-Wilk test), a skewed distribution and a ceiling effect in the answers was observed in all four variables; therefore, robust nonparametric tests were applied in the analysis (Šimkovic & Träuble 2019): Mann-Whitney tests were carried out to make comparisons within demographic groups based on gender, background (geographical and academic), years since camp, and the number of camp participation.

The thematic analysis method was applied to process answers to all open questions of the survey. A deductive approach was applied in essentialist/realist paradigms (Lincoln et al. 2011; Szokolszky 2004). We were following the six phases of thematic analysis described by Braun and Clarke (2006). The first author extracted the answers to the open-ended questions and organized them into an excel sheet. The first and second authors familiarized themselves with the texts in Hungarian, created codes independently, then compared and discussed them until 90% agreement was reached on occurring themes. The last author reviewed the themes, then the first author refined the description of the themes and the chosen citations based on those suggestions and created a thematic map of the analysis to visually capture relationships and hierarchies between themes, based on Braun and Clarke (2006, 2012). Theme names, definitions, and chosen examples were translated into English by the first author. In the final analysis, we related the themes and subthemes to literature in the theoretical frameworks of illness acceptance and therapeutic recreation.

3. Results

3.1. Health-related learning outcomes

In general, we can say that youth living with serious illnesses in their daily life found both illness acceptance (M = 8.70) and health competence (M = 8.78) to be very important. The majority of participants (56.7% and 53.3%) rated their importance as 10 points, the highest value on the Likert-like survey question. The camp was found to be critical in the development of illness acceptance on average (M = 8.43), while the importance of the camp in the development of health competence was lower (M = 7.97), though no significant differences were found when compared with independent sample Mann-Whitney tests. Half of the participants rated the role of camp in illness acceptance with a maximum of 10 points. Amongst these participants, the camp was the most distinct learning environment of illness acceptance (83.3%), and the home was the primary development setting of health competence (40.7%). Besides camp and home, none of the other settings (church, sports club, school, work, other) played a distinct role in the development of these health-related skills. Results are presented in *Table 4*.

Results on both illness acceptance and health competence were compared in the demographic groups with an independent sample Mann-Whitney test: boys and girls, participants from rural and urban backgrounds, and lower and higher academic backgrounds, 1–2 times at camp or more, camp participation in the last five years or more than five years ago. A significant difference was only found in rating the importance of illness acceptance in daily life, with women rating it more important (Mdn = 10) than men (Mdn = 8) (U = 279, z = -1.95, p (2-tailed) = 0.051).

Table 4
Means, medians, and frequencies in the importance of health-related skills (n = 60)

	Illness acceptance	*Health competence*
How important the skill is in everyday life, mean (standard deviation), *median*	M = 8.70 (SD = 2.06) *Mdn = 10*	M = 8.78 (SD = 1.63) *Mdn =10*
Camp's role in skill's development, mean (standard deviation), *median*	M = 8.43 (SD = 2.22) *Mdn = 9.50*	M = 7.97 (SD = 2.31) *Mdn = 9*
In what setting did the participants primarily develop the skill amongst those who attributed the development of the given skill to the camp on a rate of 10 points?	Camp 83.3% (n = 30)	Home 40.7% (n = 27)

3.2. Qualitative results

On the open-ended questions, we obtained answers from n = 52 participants. The data set included all free-text answers to all open-ended survey questions. A data item consisted of one person's answers to various open-ended questions. Given that concepts of health acceptance and an a priori knowledge on possible outcomes of therapeutic recreation camps drove the analysis, a deductive thematic analysis approach was applied. The six steps recommended by (Braun & Clarke 2006; Braun et al. 2019) were followed in identifying recurring and important themes. After familiarizing with the data set and coding the recurring topics through the data items, we analyzed how these topics evolve in themes within the wider context of the data set. Finally, we interpreted two sets of themes: one set for the most valuable outcomes learned at camp (*outcome-themes*) and another set expressing the mechanisms, processes, or any other factor contributing to the acquisition of these outcomes (*mechanism-themes*). The coding process and examples are presented in *Table 5*. Connections between outcome-themes and mechanism-themes are pictured on a thematic map (see *Figure 1*).

Many participants reflected in some way on their pre-camp experiences and worries about being different from other kids, often because of their illness. These participants considered a positive change with respect to these feelings as the most valuable gain from camp. Independently of which exact outcome they valued – friendship, self-esteem, or illness acceptance, they described how they used to feel before camp and how they had an '*even I can…*' experience at camp. We defined these common answers as '*Restorative Experience and Growth*' and consider it an overarching big umbrella theme, under which several outcome-themes belong.

The following examples illustrate the concept of change during camp experience:

> *'*Before I was afraid and felt like I was worth nothing… Now I dare to accept who I am and what kind of illness I have. I am valuable like this, and I am a whole person like this as well.'– *theme positive approach to illness;*
> 'Even I can have friends. Before camp, I did not have any friends and was bullied at school because of my illness. But I gained many friends at camp, and we keep in touch even today.' – *theme social connectedness;*
> *'*I arrived at my last camp with serious self-awareness problems when I was 17. Camp totally fixed me.' – *theme self-evaluation;*
> 'I began to like the world.'– *theme social connectedness.*

We identified another overarching theme and named it '*Unconditional acceptance*', which refers to a common mechanism or process at camp that made the valuable learning outcomes possible. This theme also includes several mechanism-themes, and common is the idea of unconditionality in either perceived empathy, patience, social support, or positive emotions from camp or people at camp. Examples:

> 'Friendship, acceptance, love. Many outsiders can't accept people who are a little different from the average. Here everyone has gone through something and does not treat the other with amazement or expulsion.'– theme unconditionality;
> 'All those merry volunteers who related to me as if I were healthy. I could treat myself as normal afterward' – theme personal connections and unconditionality;
> 'Unconditional love, trust, and altruism – I think these are the most important things for campers in a state of mind like mine, who come there to dare to open up and step out of the gray of everyday life.' – theme unconditionality.

Different outcome-themes inherently belong under '*Restorative Experience and Growth',* but to a varying extent – we will present them in the order of the connectedness to the umbrella theme and also discuss what mechanism-themes contribute to the development of these subjectively valuable experiences. Connections are also presented in *Figure 1.* A thicker line indicates a stronger association between themes, mentioned by more participants, and the arrows indicate the direction of effect. Most connected to *restorative experience* is the outcome-theme we call *Social connectedness* (mentioned 28 times), which expresses friendships, the ability to make friends, the quality of these relationships, and the emotions expressing connectedness: love, trust, and belonging. A considerable proportion of participants see better relationships as the most valuable experience gained in camp

and still important for them in their daily life. The development of this experience was supported most prominently by the mechanism-theme *Personal connections* (27), especially with peers, their love, support, example, and *Camp programs* (14) providing teamwork and possibilities to have deep conversations.

The development of a *Positive approach to illness* (mentioned 14 times) was another central outcome of camp extracted from participants' answers about acceptance and a growing tolerance towards their illness. Many participants claim to perceive fewer limitations after feeling *Unconditionality* in the acceptance, support, and empathy of *Personal connections*.

Recurring topics of higher self-esteem, a stronger connection with one's identity, personal development, and self-acceptance, were attributed to the camp. We summarized these topics into the theme of *Self-Evaluation* (18), they were mostly influenced by mechanism-theme *Personal connections* (27). The unconditional support and attention of camp counselors were the most distinctive contributions of the camp to this personal development. For example, this support could be realized through program elements, like evening cabin talks. Also, camp counselors and peers were considered as role models and seen as reference points for future development. A combination of values that we refer to as *Camp spirit* (14) were considerable factors in the development of a positive *Self-Evaluation* (18).

The outcome-theme of a *Proactive attitude to life* (16) was evolving from perceived changes and perseverance in risk-taking; i.e. feeling more courageous, developing and applying an open mindset to explore new things. Growth in *Proactive attitude to life* was perceived by the participants mostly through C*amp programs*, especially through adventure programs, performances, and guided group activities. This theme was less directly connected to *Restorative Experience*, but *Growth* was present and had an importance in the participants' daily lives.

The most prominent drivers of change in camp appear to be related to the people at camp: peers have a great effect on campers through potential friendships, social support, and an 'if she can do it, I can do it, too'-like comparison based social self-efficacy. Even more apparent was the role of camp counselors, who seem to be representing the most *Unconditionality* and are present as role models. Feeling accepted as an outcome inherently belongs to the acceptance that others are showing; therefore, we included the outcome acceptedness into the mechanism-theme acceptance as well. The mechanism-theme *Camp program* was less related to unconditional attention but it stood not completely independent either as camp programs are the context of attention and support from the counselors. From the camp program elements, the high-rope adventure park, group games, and the evening cabin talks stand out. The construct of *Camp spirit* stands for an experience in which many participants (10) simply used the camp's name to describe it as something unique and special. It can be described as a combination of a friendly environment with the encouraging presence of special people. Participants expressed that in the camp they

experienced a very positive value system they long for in everyday life. However, several participants noted that it is hard to experience this spirit outside of camp, for example: 'It is an artificial environment that does not exist in real life.'

We obtained very little feedback about what resources could help campers transfer their positive camp experiences into everyday life. Some participants indicated that supporting family members, camp friendships, and camp reunion programs stood out as the factors that helped them to maintain camp benefits.

Table 5
Identified codes, themes, and overarching themes with frequencies and examples

Overarching themes	*Themes*	*Codes*	*Examples*
Restorative Experience and Growth	Social connectedness (28)	Friends (8) Sense of community (2) Social skills (2) Love (7) Empathy (6) Support (2) Acceptance (3)	'I am not alone' 'Even I can have friends' 'Feeling of community' 'I realized it there what real friendship is' 'Giving and receiving unconditional love' 'Empathy towards others. People can only rely on others and this is essential' 'Acceptance. Because I came to like the world'
	Self-Evaluation (18)	Self-esteem (6) Identity (1) Feeling accepted (8) Career orientation (2) Openness (1)	'To trust in myself and to know that I am valuable even though the outside world shows the opposite' 'I would like to come back as a volunteer' 'The things I have learned about myself' 'Because these skills are crucial in my work' 'Openness. New chances opened up for me'
	Positive approach to illness (14)	Illness acceptance (11) Hope (2) Health control (1)	'I can accept my health condition' 'I can live a happy life with an illness as well' 'They helped me to believe that I can do anything even having a chronic illness' 'The control over my health condition'
	Proactive attitude (17)	Perseverance (6) Accepting challenge (9) Growth (1) Patience (1)	'Never give up!' 'Not being afraid of trying new things' 'They taught me that I am able to do anything' 'I dare to leave the comfort zone' 'Patience. Because it is very useful in the grayness of daily life'
	Fun (8)	Joy (3) Memorable, unique experience (6)	'I have not learned anything. I was simply enjoying it' 'Such values and experiences cannot really be experienced elsewhere'

Unconditional acceptance	Unconditionality (12)	Support (4)	
		Normalizing experience (4)	'All those merry volunteers who related to me as if I were healthy. I could treat myself as normal afterwards'
		Care (1)	
		Patience (1)	
		Feeling accepted (8)	'They accepted me as I am, helped me to overcome my fears, and I heard from my peers that they face the same problems as I do'
	Camp spirit (14)	Camp (8)	'The camp highlighted the values that people slip by in everyday life'
		Values (2)	'The spirit of camp taught me that together we are capable of everything'
		Fun (1)	
		Diversity (1)	
		Illness (2)	'I could not have participated if I did not have my illness'
	Personal connections (27)	Peers (11)	'The other kids who have gone through the same as me'
		Volunteers (9)	'The volunteers believed in me even when I did not believe in myself'
		Role models (3)	'They are role models for me'
		Community (4)	'The energy of a community'
	Camp program (14)	Challenge programs (3)	'The adventure park gave me strength and courage"
		Program (8)	'Programs made me go beyond my usual tasks"
		Teamwork (1)	
		Important conversations (2)	'Evening talks"

Restorative Experience and Growth and *Unconditional acceptance* are interconnected constructs, and the first is, in most aspects, an outcome of the second. The restorative experience seems to happen through the experienced or witnessed unconditionality of acceptance, care, support, love, and empathy. In many cases, vulnerability and fear were expressed as dominant life experiences. In these cases, some kind of healing may have happened through the recognition and fulfillment of basic needs for connectedness and for feeling valuable ('even I can have friends'). In another large proportion of cases, the outcome was expressed as development or growth in the areas which are present in the camp's mechanisms: empathy (6) and social support (2). Openness is part of the mechanism and part of the outcome as well. Data suggests that growth in life skills can also be experienced through observing others (role models were mentioned three times).

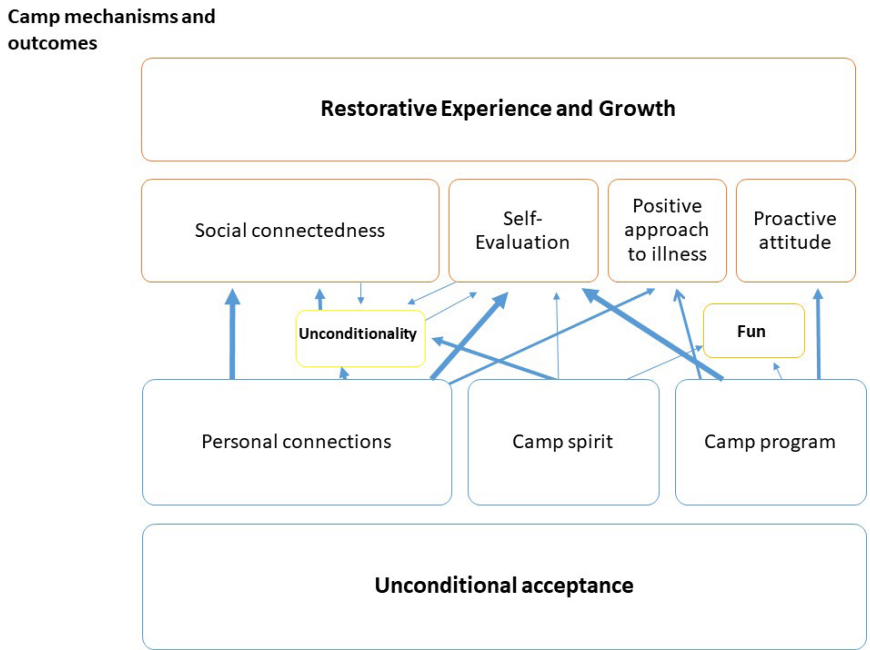

Figure 1
Thematic map extracted from the answers of camp participants picturing the outcome-themes in red and mechanism-themes in blue. The yellow themes are both outcomes and mechanisms. The size of boxes indicates frequencies, and the arrows show relationships between themes.

4. Discussion

Our results from the mixed-methods analysis of this retrospective survey suggest that health acceptance and health management stand as important life skills for youth living with serious illness, and they relate their camp experience to the development of these skills. Almost half of our sample stated that they learned to accept their health condition primarily at camp. The qualitative analysis of open-ended survey answers confirmed these results: the most dominant benefits from TR based camp seem to be a restorative experience and growth in psychosocial domains such as social connectedness, self-evaluation, illness acceptance, and a positive, proactive attitude towards life – especially for those who have experienced illness-based limitations in life before. A good example is what one participant wrote about the importance of illness acceptance and how camp helped: 'If I cannot accept it, I cannot defeat it'. There was a common element in the themes of social, health-related, and assertive

outcomes: participants reflected on a kind of change or growth compared to their before-camp limitations in activities or psychosocial areas, these limitations mostly related to their illness. We called this sense of change 'restorative experience'; it was related to the accepting, empathetic positive camp environment: to camp counselors, peers, and camp program elements.

Demographic factors, such as the number of participations and years since the last camp did not show differences in health competence or illness acceptance, except that health competence remained more important for women. We suggest that young women are more conscious about their health status and by having lower self-efficacy, the importance of improvement in this area might be more valuable for them. Health-competence is strongly connected to self-efficacy (Smith et al. 1995), and lower self-efficacy in female youth with a serious illness was observed among others by Török and colleagues (2006): girls participating in TR based camp typically had lower self-esteem and self-efficacy initially than boys, and those adolescents who had relatively lower initial points on self-esteem and self-efficacy showed the largest and most stable elevation on both constructs after camp. Though our results can be interpreted only within certain limitations: the findings on health acceptance and health competence are based only on 1-1 item survey question each, the distribution was found very skewed and a ceiling effect has to be taken into account.

Our sample's size and heterogeneity in age, medical condition, and since last camp participation, allow only limited interpretations of the results. But our findings from the qualitative data provided some insight into how this change in self-efficacy may happen through camp: those who wrote about limitations and lower self-esteem before camp expressed restorative experiences from camp, even years later. Those who did not report specifically low self-esteem or limitation expressed rather a notion of growth in psychosocial areas. A growing number of qualitative research aims to phenomenologically grasp the camp experience as well, and the benefits of the camp on various psychosocial domains are more elaborated (Evangeli et al. 2019; Gillard & Allsop 2016; Lut et al. 2017; Meltzer et al. 2018). Laing and Moules (2014) described a similar healing experience through strong supportive and accepting social connections. We can relate our findings of the elements from this restorative experience and growth to Gillard and Allsop's (2016) study, where they investigated the meaning of the camp experience for adolescents through interviews. They found that belonging, enjoyment, being themselves, positive affect, camp programming, adult staff, personal growth, and escape were the camp's most meaningful features. We could add to the findings of Gillard and Allsop's (2016) one important aspect from our results: having a positive relationship with one's health condition was a topic that explicitly returned in various open answers in the survey. It seems a camp is a unique place for children with a serious illness where this personal development can be addressed openly

and where the illness and the 'being different' experience may be integrated into one's identity.

The most prominent outcomes of the camp based on our study were the development of social connections via positive encounters with peers and counselors in an accepting environment. Strong social skills and social support relate to resilience and may serve as protective factors against a broad range of life stressors (Kearney 2018; Kim & Yoo 2010). Cohen and colleagues' (1997) study demonstrated that strong social support is associated with increased feelings of self-esteem, self-worth, positive emotions, the use of effective coping mechanisms, and a wide network of social relationships, which can lead to better immune function (Cohen 2004; Cohen et al. 1997). Feeling socially connected and having a sense of belonging are therefore important constructs of wellbeing (Jenkins et al. 1990) and crucial for rehabilitation programs to provide opportunities for youth with serious medical illnesses in order for them to practice and develop social skills, as this may promote positive functioning in relationships, as well as positive psychosocial and physical quality of life (Tominey et al. 2015). A broad number of studies confirmed the benefits of the camp in the social dimensions, and can be even considered as a special and complex context of socialization for youth from a very diverse backgrounds – also for youth living with serious illness (Allsop et al. 2013; Bialeschki et al. 2007; Browne et al. 2019; Bultas et al. 2016; Gillard & Watts 2013; Kiernan et al. 2004; Meltzer et al. 2018). Quality social interactions are important contributors in the camp to better health acceptance, self-esteem, and self-efficacy. Self-efficacy and illness acceptance have both internal and social domains in their development. Turner and Shepherd (1999) highlighted the role of peer interactions and peer education programs based on Bandura's model: those peers have the greatest potential effect on participants, who are relatively close but are perceived as competent or popular members of a group. We suggest that TR programs consciously provide multiple situations in which participants can perceive themselves or observe others becoming successful and competent in completing challenging tasks. In this sense, those camp counselors who are relatively close to campers in age can also play an important role in fostering self-efficacy and self-esteem by becoming role models. Similarly to how Kearney (2009, 83) describes the role of counselors: 'In many ways, the Caras are the heart of Barretstown. They set the atmosphere through their zany styles of communitas'.

A large proportion of campers wrote that the main benefits of camp derive from an unconditional positivity of the camp: in communication, in support, or even in a positive environment. Unconditionality appeared to be not only important in emotional or communicational aspects but also in providing the chance to make choices for every camp participant independently of their condition. Unconditional acceptance is the basis of the humanistic person-centered therapies developed and described profoundly by Carl Rogers (1973), and later considered as one of the

common factors of the efficacy of psychotherapies in general. A variety of studies confirm that the unconditional acceptance and support experienced in positive relationships with significant others were associated with self-acceptance and positive self-perception in a variety of areas from personality development (Frankel et al. 2012) to academic achievement (Makri -Botsari 2015). Here we suggest that unconditional acceptance is associated with a kind of healing growth in self-esteem, self-efficacy, and social connections in camp, as well as through the humanistic approach of camp spirit, values, and interpersonal interactions.

It is worth noting that the TR program elements were not explicitly named as dominant contributors to the camp outcomes in our retrospective study. Though TR, as defined in European camp settings providing challenge-success-reflection-discovery (Hosszú & Lénárd 2015; Jennings & Guerin 2014; Kearney 2009), is inherently present in the restorative experiences of participants, the notion of 'even I can do it' is present in the whole data set, but more prominently linked to the unconditional acceptance and support of the social environment. One-third of camp participants referred to some concrete program element where they made a significant discovery about themselves; for example, how going through the high rope track or horseback riding could contribute to healing or growing self-esteem. Many mentioned the importance of sharing these experiences with peers who used to have similar limitations. We suggest that observing peers on the high rope track and cheering for them creates an important contribution to the improvement of self-efficacy through peer experiences, as described above.

TR camps seem to have the potential to become restorative places. A variety of research suggests that natural environments like summer campsites can be associated with mental health benefits (Hansen-Ketchum et al. 2011; Kaplan 1992; Korpela et al. 2002). Also, outdoor adventure programs produce a confirmed effect on adolescents' mental health, especially if screen time is limited (Mutz et al. 2019; Tillmann et al. 2018). Though Camp of Courage is not located in a wilderness and little free time is left during tight TR programming for peacefully exploring nature, through the dominance of outdoor programs, however, and the screen-free environment, Camp of Courage still can be considered as a potential therapeutic landscape (Kearns & Collins 2000). In our qualitative results, 'camp spirit' was extracted as an important contributor to the wellbeing and psychosocial rehabilitation of youth having serious illnesses. The camp as a special *place* was mentioned in the data set, and participants referred to the camp as an environment where the worries of everyday life are far. It is like a special, hidden world where they can live free, and interactions seem to work easier and are more loving and satisfying than in everyday environments – which experiences are comparable to the literature of restorative places, or similar to what Gillard and Allsop (2016) described as an escape.

We can conclude that therapeutic recreation-based camps may be useful and effective ways of tertiary rehabilitation in a sense of improving psychosocial func-

tioning. TR-based camps are not only improving HRQoL through psychosocial factors, but they are also able to enhance illness acceptance and increase perceived health competence. Later on, these are predictors of health management in the daily maintenance and treatment of a serious health condition like diabetes or recurring late side effects of childhood cancer survivors (Oeffinger et al. 2006; Williams et al. 2002). Based on our qualitative findings, the most dominant elements of Camp of Courage appear to be the unconditional acceptance, empathy, and social support worked out through mostly interpersonal interactions with peers and camp counselors. We suggest that TR program elements provide a framework where change can happen and the unconditionally supportive psychosocial environment of a disease-specific camp with the special selection of camp counselors fills this framework up with emotions and make it an even more memorable and life-changing restorative experience. This is especially for those who have experienced illness-related boundaries in life. The question arises whether these results are possible without the framework of TR programs, but may be based on other camp program elements. We suggest the TR method and the unconditionality of the camp both contribute to the restorative experience, but further research is recommended to compare illness-specific camp programs with TR camps.

5. Implications

Based on our results, we suggest further investigations regarding the role of illness acceptance and health competence in tertiary prevention. A closer understanding of camp program elements' mechanisms on improving psychosocial wellbeing, especially self-efficacy and self-esteem, which have both clinical and practical implications, could contribute to program development and staff training. We recommend the further investigation and specification of TR elements and the APIE model during camp program planning. From our results, the role of personal interactions in psychosocial wellbeing and illness acceptance stands out. Further research could explore the role of volunteer camp staff and the group dynamics in camp as providing an ambience for growth and unconditional support. As for camp programming, we would like to recommend further development of family, school, or community-based programs to improve unconditional acceptance in the environment of children living with serious illnesses. These programs could potentially help to retain as much as possible from the camp's positive experiences.

6. Limitations

Sampling bias has to be considered as we obtained data through an online survey, and potentially those who have positive affections towards the camp took the time

and effort to answer. This might be related to the ceiling effect found in the quantitative section. The retrospective design, the questions' subjectivity, the qualitative limits in the data set of free-text answers to survey questions, and the subjectivity of the data analysis method only permit interpretations within a specific level of comprehending experiences from Camp of Courage. We have to consider that as a convergent mixed-method designed study (Fetters et al. 2013), the quantitative questions regarding possible camp outcomes in the first part of the survey may have influenced themes coming up in the second, qualitative part of the survey.

References

Allsop, J., S. Negley & J. Sibthorp (2013) 'Assessing the Social Effect of Therapeutic Recreation Summer Camp for Adolescents with Chronic Illness', *Therapeutic Recreation Journal* 47(1), 35–46.

Bandura, A. (1997) *Self-efficacy: The Exercise of Control* (New York: W.H. Freeman).

Békési, A., S. Török, G. Kökönyei, I. Bokrétás, A. Szentes, G. Telepóczki & European KIDSCRREN Group (2011) 'Health-Related Quality of Life Changes of Children and Adolescents with Chronic Disease After Participation in Therapeutic Recreation Camping Program', *Health and Quality of Life Outcomes* 9, 43 (https://doi.org/10.1186/1477-7525-9-43).

Bialeschki, M.D., K.A. Henderson & P.A. James (2007) 'Camp Experiences and Developmental Outcomes for Youth', *Child and Adolescent Psychiatric Clinics of North America* 16(4), 769–88.

Braun, V. & V. Clarke (2006) 'Using Thematic Analysis in Psychology', *Qualitative Research in Psychology* 3(2), 77–101 (https://doi.org/10.1191/1478088706qp063oa).

Braun, V. & V. Clarke (2012) 'Thematic analysis' in H. Cooper, P.M. Camic, D.L. Long, A.T. Panter, D. Rindskopf & K.J. Sher, eds., *APA Handbook of Research Methods in Psychology, Vol. 2. Research Designs: Quantitative, Qualitative, Neuropsychological, and Biological*, 57–71 (Washington: American Psychological Association) (https://doi.org/10.1037/13620-004).

Braun, V., V. Clarke, N. Hayfield & G. Terry (2019) 'Thematic Analysis' in P. Liamputtong, ed., *Handbook of Research Methods in Health Social Sciences* (Singapore: Springer), 843–60 (https://doi.org/10.1007/978-981-10-5251-4_103).

Browne, L.P., A. Gillard & B.A. Garst (2019) 'Camp as an Institution of Socialization: Past, Present, and Future', *Journal of Experiential Education* 42(1), 51–64 (https://doi.org/10.1177/1053825918820369).

Bultas, M.W., A.D. Schmuke, V. Moran & J. Taylor (2016) 'Psychosocial Outcomes of Participating in Pediatric Diabetes Camp', *Public Health Nursing* 33(4), 295–302 (https://doi.org/10.1111/phn.12218).

Carter, M.J. & G.E. Van Andel (2019) *Therapeutic recreation: A practical approach* (5th ed., Long Grove: Waveland).

Cohen, S. (2004) 'Social Relationships and Health', *American Psychologist* 59(8), 676–84. (https://doi.org/10.1037/0003-066X.59.8.676).

Cohen, S., W.J. Doyle, D.P. Skoner, B.S. Rabin & J.M. Gwaltney Jr. (1997) 'Social Ties and Susceptibility to the Common Cold', *Journal of the American Medical Association* 277(24), 1940–44.

DeRosa, B.W., A.E. Kazak, K. Doshi, L.A. Schwartz, J. Ginsberg, J.J. Mao, J. Straton, W. Hobbie, M.T. Rourke, C. Carlson & R.F. Ittenbach (2011) 'Development and Validation of the Health Competence Beliefs Inventory in Young Adults with and without a History of Childhood Cancer', *Annals of Behavioral Medicine* 41(1), 48–58 (https://doi.org/10.1007/s12160-010-9228-y).

Evangeli, M., L. Nesbitt, R. Hinch, A. Ely & I. Lut (2019) ' "It Was Giving Them a Feeling That They're Not Alone in This": Perspectives Of Caregivers And Clinicians on a Camp for UK Adolescents with HIV', *Children and Youth Services Review* 102, 73–78 (https://doi.org/10.1016/j.childyouth.2019.05.006).

Felton, B.J. & T.A. Revenson (1984) 'Coping with Chronic Illness: A Study of Illness Controllability and the Influence of Coping Strategies on Psychological Adjustment', *Journal of Consulting and Clinical Psychology* 52(3), 343–53.

Fetters, M.D., L.A. Curry & J.W. Creswell (2013) 'Achieving Integration in Mixed Methods Designs—Principles and Practices', *Health Services Research* 48(6pt2), 2134–56 (https://doi.org/10.1111/1475-6773.12117).

Frankel, M., H. Rachlin & M. Yip-Bannicq (2012) 'How Nondirective Therapy Directs: The Power of Empathy in the Context of Unconditional Positive Regard', *Person-Centered & Experiential Psychotherapies* 11(3), 205–14 (https://doi.org/10.1080/14779757.2012.695292).

Fredericks, E.M. (2009) 'Nonadherence and the Transition to Adulthood', *Liver Transplantation* 15(S2), S63–S69 (https://doi.org/10.1002/lt.21892).

Gillard, A. & J. Allsop (2016) 'Camp Experiences in the Lives of Adolescents with Serious Illnesses', *Children and Youth Services Review* 65, 112–19 (https://doi.org/10.1016/j.childyouth.2016.04.001).

Gillard, A. & C.E. Watts (2013) 'Program Features and Developmental Experiences at a Camp for Youth with Cancer', *Children and Youth Services Review* 35(5), 890–98 (https://doi.org/10.1016/j.childyouth.2013.02.017).

Grady, P.A. & L.L. Gough (2014) 'Self-Management: A Comprehensive Approach to Management of Chronic Conditions', *American Journal of Public Health* 104, e25–e31 (https://doi.org/10.2105/AJPH.2014.302041).

Hansen-Ketchum, P.A., P. Marck, L. Reutter & E. Halpenny (2011) 'Strengthening Access to Restorative Places: Findings from a Participatory Study on Engaging with Nature in the Promotion of Health', *Health & Place* 17(2), 558–71 (https://doi.org/10.1016/j.healthplace.2010.12.014).

Hosszú, D. (2011) 'Terápiás reakció - eszköz és módszer a Bátor Táborban' [Therapeutic recreation - a tool and a method in the Camp of Courage] in E.G. Kiss & L. Polyák, eds., *Fogyatékossággal* élők *közösségfejlesztő gyakorlata* és *módszerei Közép-Európában. A Magyar ILCO Szövetség 2011-es konferenciájának válogatott, lektorált tanulmányai* (Kaposvár: Magyar ILCO Szövetség) 143–52.

Hosszú, D. & K. Lénárd (2015) 'Gyermeküket elveszített családok gyásza- egy lehetőség a poszttraumás növekedésre' [Grief of families who lost a child - possibilies of posttraumatic growth] in E.C. Kiss & H. Sz Makó, eds., *Gyász, krízis, trauma* és *a megküzdés lélektana* (Pécs: Pro Pannonia) 58–77.

Jakab, Z. & M. Garami (2018) 'Magyar Gyermekonkológiai Hálózat: Országos Gyermektumor Regiszter', *Gyermekgyógyászati Továbbképző Szemle* (23)1, 19–23.

Jenkins, C.D., R.T. Jono, B.-A. Stanton & C.A. Stroup-Benham (1990) 'The Measurement of Health-Related Quality of Life: Major Dimensions Identified by Factor Analysis', *Social Science & Medicine* 31(8), 925–31 (https://doi.org/10.1016/0277-9536(90)90032-N).

Jennings, C.J. & S. Guerin (2014) 'Therapeutic Recreation Models of Practice: A Synthesis of Key Elements and Examination of Children's Narratives of a Camp Experience for Evidence of These Elements', *Therapeutic Recreation Journal* 48(4), 303–19, retrieved 14 Oct 2021 from https://www.proquest.com/scholarly-journals/therapeutic-recreation-models-practice-synthesis/docview/1649040374/se-2?accountid=32048.

Kaplan, S. (1992) 'The Restorative Environment: Nature and Human Experience' in D. Relf ed., *The Role of Horticulture in Human Well Being and Social Development* (Portland, OR: Timber) 134–42.

Kearney, P.J. (2009) 'The Barretstown Experience: A Rite of Passage', *Irish Journal of Sociology* 17(2), 72–89 (https://doi.org/10.7227/IJS.17.2.6).

Kearney, P.J. (2018) *Healing Rites of Passage: Salutogenesis in Serious Fun Camps* (1st ed., London: Routledge).

Kearns, R.A. & D.C.A. Collins (2000) 'New Zealand Children's Health Camps: Therapeutic Landscapes Meet the Contract State', *Social Science & Medicine* 51(7), 1047–59 (https://doi.org/10.1016/S0277-9536(00)00020-4).

Kiernan, G. & M. Maclachlan (2002) 'Children's Perspectives of Therapeutic Recreation: Data from the "Barretstown Studies" ', *Journal of Health Psychology* 7(5), 599–614 (https://doi.org/10.1177/1359105302007005678).

Kiernan, G., M. Gormley & M. MacLachlan (2004) 'Outcomes Associated with Participation in a Therapeutic Recreation Camping Programme for Children from 15 European Countries: Data from the "Barretstown Studies" ', *Social Science & Medicine* 59(5), 903–13 (https://doi.org/10.1016/j.socscimed.2003.12.010).

Kim, D.H. & I.Y. Yoo (2010) 'Factors Associated with Resilience of School Age Children with Cancer', *Journal of Paediatrics and Child Health* 46(7-8), 431–36 (https://doi.org/10.1111/j.1440-1754.2010.01749.x).

Korpela, K., M. Kyttä & T. Hartig (2002) 'Restorative Experience, Self-Regulation, and Children's Place Preferences', *Journal of Environmental Psychology* 22(4), 387–98 (https://doi.org/10.1006/jevp.2002.0277).

Laing, C.M. & N.J. Moules (2014) 'Children's Cancer Camps: A Sense of Community, a Sense of Family', *Journal of Family Nursing* 20(2), 185–203 (https://doi.org/10.1177/1074840714520717).

Larcombe, I., M. Mott & L. Hunt (2002) 'Lifestyle Behaviours of Young Adult Survivors of Childhood Cancer', *British Journal of Cancer* 87, 1204–09 (https://doi.org/10.1038/sj.bjc.6600632).

Lewko, J., B. Polityńska, J. Kochanowicz, W. Zarzycki, A. Okruszko, M. Sierakowska, B. Jankowiak, M. Górska, E. Krajewska-Kulak & K. Kowalczuk (2007) 'Quality of Life and its Relationship to the Degree of Illness Acceptance in Patients with Diabetes and Peripheral Diabetic Neuropathy', *Advances in Medical Sciences* 52(Suppl 1), 144–46.

Lincoln, Y.S., S.A. Lynham & E.G. Guba (2011) 'Paradigmatic Controversies, Contradictions, and Emerging Confluences, Revisited' in N.K. Denzin & Y.S. Lincoln, eds., *The Sage Handbook of Qualitative Research* (4th ed., Thousand Oaks: Sage) 97–128.

Lut, I., M. Evangeli & A. Ely (2017) ' "When I Went to Camp, It Made Me Free": A Longitudinal Qualitative Study of a Residential Intervention for Adolescents Living with HIV in the UK', *Children and Youth Services Review* 79, 426–31 (https://doi.org/10.1016/j.childyouth.2017.07.002).

Mackie, E., J. Hill, H. Kondryn & R. McNally (2000) 'Adult Psychosocial Outcomes in Long-Term Survivors of Acute Lymphoblastic Leukaemia and Wilms' Tumour: A Controlled Study', *The Lancet* 355(9212), 1310–14 (https://doi.org/10.1016/S0140-6736(00)02112-7).

Makri-Botsari, E. (2015) 'Adolescents' Unconditional Acceptance by Parents and Teachers and Educational Outcomes: A Structural Model of Gender Differences', *Journal of Adolescence* 43, 50–62 (https://doi.org/10.1016/j.adolescence.2015.05.006).

Mazurek, J. & J. Lurbiecki (2014) 'Akceptacji Choroby i jej znaczenie w praktyce klinicznej' [Acceptance of illness scale and its clinical impact], *Polski Merkuriusz Lekarski* 36(212), 106–08.

Meltzer, L.J., D.M. Graham, S. Leija, G.D. Booster, T. Carroll, B. Seeger & M. Bledsoe (2018) 'Benefits of Disease-Specific Summer Camps: Results from Quantitative and Qualitative Studies at Roundup River Ranch', *Children and Youth Services Review* 89, 272–80 (https://doi.org/10.1016/j.childyouth.2018.04.046).

Moola, F., G.E.J. Faulkner, L. White & J.A. Kirsh (2014) 'The Psychological and Social Impact of Camp for Children with Chronic Illnesses: A Systematic Review Update', *Child: Care, Health and Development* 40(5), 615–31 (https://doi.org/10.1111/cch.12114).

Mutz, M., J. Müller & A. Göring (2019) 'Outdoor Adventures and Adolescents' Mental Health: Daily Screen Time as a Moderator of Changes', *Journal of Adventure Education and Outdoor Learning* 19(1), 56–66 (https://doi.org/10.1080/14729679.2018.1507830).

Németh, Á. & D. Várnai, eds. (2019) *Kamaszéletmód Magyarországon* [Adolescents' lifestyle in Hungary, International research Health Behaviour of School Aged Children in cooperation with World Health Organisation] (Budapest: L'Harmattan).

Nolte, E. (2008) 'Disease Prevention' in H.K. Heggenhougen ed., *International Encyclopedia of Public Health* (Academic Press) 222–34 (https://doi.org/10.1016/B978-012373960-5.00675-4).

Nouwen, A., G. Urquhart Law, S. Hussain, S. McGovern & H. Napier (2009) 'Comparison of the Role of Self-Efficacy and Illness Representations in Relation to Dietary Self-Care and Diabetes Distress in Adolescents with Type 1 Diabetes', *Psychology & Health* 24(9), 1071–84 (https://doi.org/10.1080/08870440802254597).

Obiegło, M., I. Uchmanowicz, M. Wleklik, B. Jankowska-Polańska & M. Kuśmierz (2016) 'The Effect of Acceptance of Illness on the Quality of Life in Patients with Chronic Heart Failure', *European Journal of Cardiovascular Nursing* 15(4), 241–47 (https://doi.org/10.1177/1474515114564929).

Oeffinger, K.C., A.C. Mertens, C.A. Sklar, T. Kawashima, M.M. Hudson, A.T. Meadows, D.L. Friedman, N. Marina, W. Hobbie, N.S. Kadan-Lottick, C.L. Schwartz, W. Leisenring & L.L. Robison (2006) 'Chronic Health Conditions in Adult Survivors of Childhood Cancer', *New England Journal of Medicine* 355, 1572–82 (https://doi.org/10.1056/NEJMsa060185).

Papp, Z. (2021) 'Krónikus beteg gyermeket nevelő családok pszichoszociális intervenciójáról – terápiás rekreációs táborok' [Psychosocial intervention for families raising children with serious illness – therapeutic recreation camps], *Interdiszciplináris Magyar Egészségügy* 2021(2), 21–27 (https://doi.org/10.53020/IME-2021-204).

Rea, K.E., L.F. Quast, M.G. Stolz & R.L. Blount (2019) 'A Systematic Review of Therapeutic Recreation Camp Impact on Families of Children with Chronic Health Conditions', *Journal of Pediatric Psychology* 44(5), 542–56 (https://doi.org/10.1093/jpepsy/jsz003).

Richmond, D., J. Sibthorp & C. Wilson (2019) 'Understanding the Role of Summer Camps in the Learning Landscape: An Exploratory Sequential Study', *Journal of Youth Development* 14(3), 9–30 (https://doi.org/10.5195/jyd.2019.780).

Rigó, A. & G. Kökönyei (2014) 'Bevezető. Az életminőséggel kapcsolatos fő szakirodalmi kérdések krónikus szomatikus betegséggel élők körében' [Main

Questions on quality of life patients living with chronic somatic diseases] [Introduction], *Alkalmazott Pszichológia* 14(4), 5–14.

Rogers, C. (1973) 'The Interpersonal Relationship: The Core of Guidance' in R.M. Maslowski & L.B. Morgan, eds., *Interpersonal Growth and Self Actualization in Groups* (New York: MMS Information) 176–90.

Sattoe, J.N.T., M.I. Bal, P.D.D.M. Roelofs, R. Bal, H.S. Miedema & A. van Staa (2015) 'Self-Management Interventions for Young People with Chronic Conditions: A Systematic Overview', *Patient Education and Counseling* 98(6), 704–15 (https://doi.org/10.1016/j.pec.2015.03.004).

Sax, L.J., S.K. Gilmartin & A.N. Bryant (2003) 'Assessing Response Rates and Nonresponse Bias in Web and Paper Surveys', *Research in Higher Education* 44, 409–32 (https://doi.org/10.1023/A:1024232915870).

Šimkovic, M. & B. Träuble (2019) 'Robustness of Statistical Methods When Measure is Affected by Ceiling and/or Floor Effect', *PloS ONE* 14(8), e0220889 (https://doi.org/10.1371/journal.pone.0220889).

Smith, M.S., K.A. Wallston & C.A. Smith (1995) 'The Development and Validation of the Perceived Health Competence Scale', *Health Education Research* 10(1), 51–64 (https://doi.org/10.1093/her/10.1.51).

Stam, H., E.E. Hartman, J.A. Deurloo, J. Groothoff & M.A. Grootenhuis (2006) 'Young Adult Patients with a History of Pediatric Disease: Impact on Course of Life and Transition Into Adulthood', *Journal of Adolescent Health* 39(1), 4–13 (https://doi.org/10.1016/j.jadohealth.2005.03.011).

Szokolszky, Á. (2004) *Kutatómunka a pszichológiában* [Research Work in Psychology] vol. 11 (Budapest: Osiris).

Tillmann, S., D. Tobin, W. Avison & J. Gilliland (2018) 'Mental Health Benefits of Interactions with Nature in Children and Teenagers: A Systematic Review', *Journal of Epidemiology & Community Health* 72, 958–66 (https://doi.org/10.1136/jech-2018-210436).

Tominey, S.L., R. Pietrzak, S. Southwick & L.C. Mayes (2015) *More Than Just SeriousFun: The Impact of Camp on Resilience for Campers with Serious Illness 2014-2015 Report*, retrieved 14 Oct 2021 from https://seriousfun.org/wp-content/uploads/2018/12/2015-SeriousFun-Pre-Post-Report_2-7-2016.pdf.

Tóth, J. & D. Hosszú (2013) 'Meg tudom tenni, át tudom élni! Élményterápia, azaz terápiás rekreáció a Bátor Táborban' [I can do it, I can live it! Experience therapy, and therapeutic recreation in the Camp of Courage] in K. Dobolán & G. Jávorka. eds., *Kis gyermekek, nagy problémák* (Budapest: RAABE).

Török, S., G. Kökönyei, L. Károlyi, A. Ittzés & T. Tomcsányi (2006) 'Outcome Effectiveness of Therapeutic Recreation Camping Program for Adolescents Living with Cancer and Diabetes', *Journal of Adolescent Health* 39(3), 445–47 (https://doi.org/10.1016/j.jadohealth.2005.12.018).

Turner, G. & J. Shepherd (1999) 'A Method in Search of a Theory: Peer Education and Health Promotion', *Health Education Research* 14(2), 235–47 (https://doi.org/10.1093/her/14.2.235).

Walker, D.A. & D. Pearman (2009) 'Therapeutic Recreation Camps: An Effective Intervention for Children and Young People with Chronic Illness?', *Archives of Disease in Childhood* 94(5), 401–06 (https://doi.org/10.1136/adc.2008.145631).

Warner, R.P., J. Sibthorp, C. Wilson, L.P. Browne, S. Barnett, A. Gillard & J. Sorenson (2021) 'Similarities and Differences in Summer Camps: A Mixed Methods Study of Lasting Outcomes and Program Elements', *Children and Youth Services Review* 120, 105779 (https://doi.org/10.1016/j.childyouth.2020.105779).

Williams, P.G., G.N. Holmbeck & R.N. Greenley (2002) 'Adolescent Health Psychology', *Journal of Consulting and Clinical Psychology* 70(3), 828 – 42.

Wilson, C. & J. Sibthorp (2018) 'Examining the Role of Summer Camps in Developing Academic and Workplace Readiness', *Journal of Youth Development* 13(1–2), 83–104 (https://doi.org/10.5195/jyd.2018.563).

World Health Organization, Regional Office for Europe, European Observatory on Health Systems and Policies, E. Nolte, C. Knai & R.B. Saltman (2014) *Assessing Chronic Disease Management in European Health Systems: Concepts and Approaches* (WHO, Regional Office for Europe) retrieved 14 Oct 2021 from https://apps.who.int/iris/handle/10665/326351.

Zebrack, B.J. (2011) 'Psychological, Social, and Behavioral Issues for Young Adults with Cancer', *Cancer* 117(S10), 2289–94 (https://doi.org/10.1002/cncr.26056).

Zsigmond, O. & A. Rigó (2019) 'Poszttraumás növekedés gyermekkorban daganatos betegségen átesett gyógyult fiatal felnőttek és daganatos betegségen átesett gyermekek szülei körében' [Posttraumatic growth among young adult survivors of childhood cancer and parents of childhood cancer survivors], *Mentálhigiéné és Pszichoszomatika* 20(4), 391–420 (https://doi.org/10.1556/0406.20.2019.018).

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MENTAL HEALTH PROBLEMS AND PATTERNS OF SELF-CARE ASSOCIATED WITH THE USE OF DIGITAL DEVICES AMONG UNIVERSITY STUDENTS

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Background: Digital devices such as computers, laptops, television (TV) and mobile phones were originally designed to support human beings' daily activities; however, they may produce several limitations as well as benefits. The main concern of the study was how the utilization of digital devices like laptops, computers and TVs affect the mental health of Nepal's university students and what are the self-care practices utilized to manage problems?
Method: 326 MPhil scholars of Nepal Open University (NOU) participated in this cross-sectional study. Digital devices pattern of use (i.e., TV, laptop and computer), mental health problems, and self-care practices among university students were assessed through a semi-structured questionnaire. Chi-square test and binary logistic regression were major statistical techniques used in the research.
Results: The study's researchers found the following mental health problems: depression (21.5%), loneliness (39.9%), anxiety (30.7%), and a loss of the sense of control (47.5%). Significant associations were found between sitting position with loneliness, age and anxiety and the daily use of computer with sense of control, loneliness, and anxiety. Additionally, computer use two to three times a week, laptop use in the evening and sitting on a chair or stool when using digital devices, stood as the main predictors respectively of the sense of control, loneliness, and depression. Few participants with mental health problems used medicine and meditation for self-care.
Conclusion: The use of digital devices was associated with mental health problems. Patterns of using computers and the preferred time to use laptops were major contributing factors for one's sense of control and loneliness, respectively. Therefore, an awareness programme concerning the use of digital devices and their effects on mental health should be communicated among university students.

Keywords: internet addiction; pathological internet use; mental health; digital devices; pattern of self-care; Nepal

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1. Introduction

Digital devices are an exciting new medium that are evolving as an essential part of everyday life all over the world. Digital devices such as computers, laptops, television (TV), mobiles and iPads were originally designed to facilitate information, communication, business transactions, entertainment, classroom studies, and research activities. However, the dramatic increase in the use of such devices in recent years has led to addiction among university students across the world. This study's researchers therefore included laptops, computers, and TVs as digital resources and the sense of control, loneliness, anxiety, and depression as mental health problems under the study. Mental health is a comprehensive issue (Kenny et al. 2020) because the global trend of death by suicide is 800,000 per year (WHO 2014), whereas that rate is 5,000 in Nepal (Bhattarai 2020), which is directly associated with mental health problems. Additionally, only 0.13 psychiatrists per 100,000 people are available in Nepal, and most of these are in an urban area, a fact indicates the majority of the population has no access to counselling and treatment (Bhattarai 2020). Several videos, audios, presentations, and text materials can be found in virtual sites, so the application of digital devices may be good resources for personal health care, self-counselling, and management of mental disorders.

Over the past few years, extensive research and surveys have been done to study the impact of digital device use on mental health. Dr. Ivan Goldberg was the first to propose the term 'internet addiction' as serious mental pathological problems (Saliceti 2015). The proper detection and diagnosis of internet addiction is difficult; however, certain characterizations such as mood modification, tolerance, withdrawal, and functional impairment signify internet addiction as Pathological Internet Use (PIU). Young and Rogers (1998) described internet addiction as PIU, which they defined as an individual's inability to control his/her use of the internet to the point that it eventually causes psychological, social, school-related and/or work difficulties in a person's life (Leung 2004; Lupton 2017; Mesmar et al. 2016). The use of smartphones is a risk factor for adults' mental health (Gowthami & Venkatakrishnakumar 2016). Utilization of ICT tools (Lindsay et al. 2008) and trauma training (Sprang et al. 2007) help care for mental health problems and self-care is more beneficial for mental health (Williams et al. 2010). The professionals who deal with mental health concerns themselves exhibit depression and loneliness (Mahoney 1997). Stress, affiliate stigma, happiness (Bonsu et al. 2020), low income and rural culture are contributing factors to mental health (Crumb et al. 2019), so relative and inexpensive preventative measures such as awareness programs should be implemented, and social, political, and health-related bodies have to exhibit careful, responsible awareness about healthcare (Colizzi et al. 2020).

The use of the Internet-based digital devices in schools, campuses and in society has increased dramatically in recent years. Those of younger age are becoming

less-regulative and more susceptible to internet-based digital devices as they depend heavily on such devices for learning, social activities, and leisure. The previous epidemiological self-report survey indicated that the prevalence rates of internet addiction among adolescents range from 0.9 to 38%, depending upon the diverse study design of methodology (Fu et al. 2010; Shaw & Black 2008), different judgment methods and sampling among various sub-populations (Laconi et al. 2014; Rooij & Prause 2014; Widyanto & Griffiths 2006). An official report in China, which is ranked as the largest internet broadband market in the world, claims that one in every six Chinese internet users may have developed some level of internet addiction (Chou et al. 2005). Scherer (1997) studied the problems of internet addiction in students. In this study, Scherer found 13% of students had interfered with their academic work, professional performance, or social lives via internet use (Chou et al. 2005). Similarly, in Young's study (1998), it was found that excessive use of the internet resulted in students distancing themselves from personal interactions with family, and occupational problems similar to those experienced with other addictions (Young 1998). Chou and Hsiao (2000), using Taiwan college student samples, had investigated students' self-assessment of their Internet use and its impact on their lives. They found that internet addicted students suffered more negative consequences in their studies and daily routines than those non-addicted students. However, there was no significant relationship between addicted and non-addicted groups of internet impacts with friends, schoolmates, parents, and teachers (Chou & Hsiao 2000). Among college students, those who use the internet more have increased depression problems (Christakis et al. 2011; Rosen et al. 2013).

The recent increase of affordable digital devices such as laptop computers, iPad, tablets, digital textbooks, e-readers, and web-enabled cell phones has increased student and instructor use of technology in college classrooms (Hoekstra 2009). Every year, students in today's classroom are becoming much more technologically savvy. Digital technology has spread out in every aspect of university students' lives such as how they play, how they socialize, how they communicate and how they learn (Mesko et al. 2017).

Given that the use of digital devices plays a central role in the lives of university students, and many students report poor mental health conditions, our study is focused on the student's feelings towards the use of digital devices: TVs, laptops, computers, and mobiles in their daily lives. However, to the best of our knowledge, no research has been published about the effect of mental health conditions like loneliness, anxiety, depression, and sense of control with the use of digital devices among the university students in Nepal. The current research is aimed to garner useful information about health awareness and practices among the different age groups of university students with reference to the excessive use of digital devices. Therefore, the study hypothesized that use of digital devices magnifies mental health problems like sense of control, loneliness, anxiety and depression among university students.

2. Materials and methods

2.1. Study setting

The study was conducted at NOU, Lalitpur, Nepal. NOU is the first open university of Nepal, recently established in 2016 AD. The university consists of three faculties: the Faculty of Science, Health and Technology, the Faculty of Social Science and Education, and the Faculty of Management and Law. From the three faculties, scholars from the Faculty of Science, Health and Technology and the Faculty of Social Science and Education, having MPhil programs on MPhil in ICT, MPhil in Nepali Education, Mathematics Education, English Education, Education Studies, Political Science, Sociology, Health, and Economics, are included in the current study. NOU's classes are entirely virtually based through BigBlueButton, Skype for Business and Microsoft Teams, and additionally there is provision and practice of three face-to-face contact sections in each semester. All virtual classes are being managed three hours per week per subject (6:00 PM to 9:00 PM Nepali time). Furthermore, all courses are being managed through the Learning Management System (LMS) Model.

2.2. Study design and sampling

The cross-sectional study design was adopted through an online survey. The sample size for the finite population was calculated through the online calculator 'Select Statistical Services'. We assumed p = 50% as no prior research was conducted in the country. After substituting the values, the sample size determined was found to be 212. By allowing 20% non-response, the final sample size obtained was 255 which is sufficient for this study (Select Statistical Services LTD 2019). We approached all MPhil scholars; i.e., 469 of Faculty of Social Science and Education and Faculty of Science, Health and Technology of the NOU. However, 326 returned the completed questionnaire giving a response rate of 69.51%.

2.3. Data collection

The data were collected from January 2019 to August 2019 through Google Form. The self-constructed tool was implemented and the tool's validity was ensured through the pre-test and the views of experts in related fields. Survey questions were created from different literatures (Baker et al. 2018; Ministry of Health, Nepal 2017). Email addresses and contact details of all students were taken from the administration of NOU and the tool was sent to all selected scholars requesting

them to fill-up the form. The researcher provided a one-month reminder through email as well as telephone. Ethical approval for this study was obtained from the Ethical Review Board of Janaki Medical College.

2.4. Definition of variables

The outcome variables were sense of control, loneliness, anxiety, and depression. All these items are associated with the mental health of the respondent and in the Yes or No form. In addition, treatment measures followed by the respondent having mental problems were measured. Four options such as using medicine, meditations, taking rest, and no treatment was given as an option to choose in all mental health-related problems. *Figure 1* provides a detailed conceptual framework.

We used six confounding variables in the research as the age of the respondent wa categorized in three parts (20–30 years, 31–40 years and ≥ 41 years), gender was categorized as male and female, and the profession was categorized in teaching and non-teaching where teaching represents teachers, lecturers, while non-teaching represent those working in other government offices, NGOs and INGOs. The distance of digital devices represents the 'eye distance' of laptop, computer and TV, which are separated into four sections; i.e., less than 1 feet (ft.), 1 ft. to 2 ft., 2 ft. to 3 ft. and more than 3 ft. Daily time to use digital devices was separated into three regiments (0–4.5 hours, 5–8.5 hours and 9–14 hours). The purpose for using digital devices has been categorized into academic and non-academic activities, where academic activities represent teaching, learning, and other official works associated with the profession, and non-academic works representing entertainment, social media, and communication. Job experience has been categorized into less than 10 years of experience and greater than or equal to 10 years of experience, based on the duration of the profession.

2.5. Statistical analysis

Frequency and percentage were presented under descriptive statistics and the Chi-square test was adopted under inferential statistics to show the association of use of digital devices: laptop, computer, and TV with mental health problems. Binary logistic regression was performed to assess the effect of using digital devices in mental health problems.

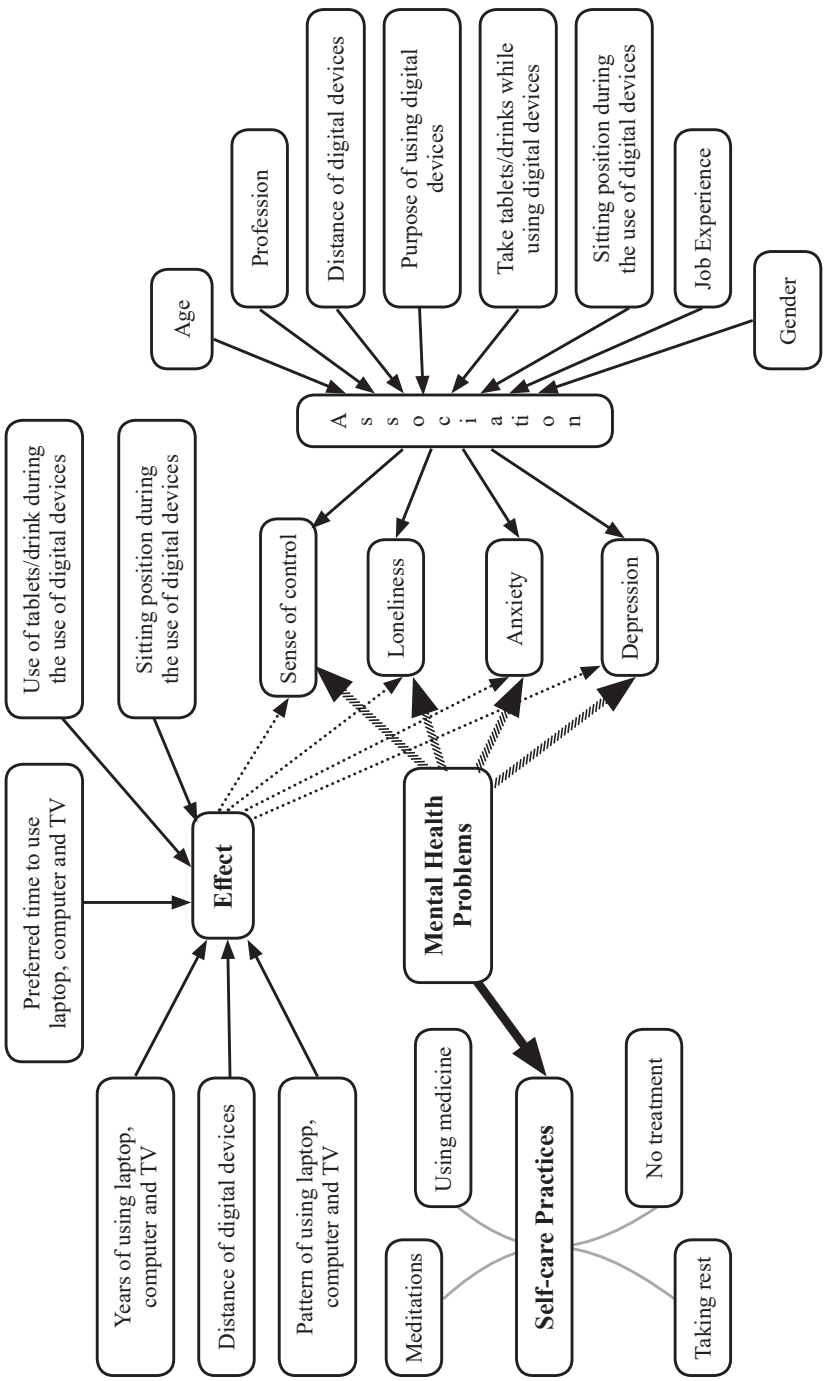

Figure 1
Conceptual Framework

3. Results

3.1. Status of mental health problems among university students

About three-fourths of the digital device users about half have sense of control (47.5%), more than one-third have loneliness (39.9%), one-third have anxiety (30.7%) and around one-fifth (21.5%) have a depression problem. The overall result of this table showed that more than half (52.5%) to around four-fifths (78.5%) have no mental health problems, which indicates that the digital devices have a positive impact on mental health problems (*Table 1*).

Table 1
Mental health problems among university students (N = 326)

Mental health effect	Yes	No	Total
	N (%)	N (%)	N (%)
Sense of control	155 (47.5)	171 (52.5)	326 (100)
Loneliness	130 (39.9)	196 (60.1)	326 (100)
Anxiety	100 (30.7)	226 (69.3)	326 (100)
Depression	70 (21.5)	256 (78.5)	326 (100)

3.2. Status of daily use of digital devices and socio-demographic characteristics among university students

Almost 90.49% (295/326) of the respondents were using a laptop daily and that rate is poor in case of daily computer use 30.01% (98/326) and moderate in the daily use of TV 56.75% (185/326). The rate of having a laptop is high because all participants were taking virtual classes and using digital devices for their different academic and non-academic activities (*Table 2*). In the survey, more than half (57.36%) of the respondents came from the 31–40 age group, more than four-fifths (86.2%) were male, around three-quarters (73.3%) engaged in teaching as a profession, and around half (49.2%) were habituated to the use of digital devices with the distance of 1–2 ft. A majority of them used digital resources for the purpose of academic activities (86.2%), around two-fifths (39.3%) of them formerly partook of tablets or drinks during the use of digital devices. Around two-thirds (62%) of the respondents were habituated to using digital devices by sitting on a chair or stool. However, women did not participate much in the study: female (13.8%), and the same case for others as distance ≥ 3 ft. distance (2.5%), using digital

resources for non-academic background (13.8%), not specified job (5.5%), and use of digital devices by lying on bed (7.4%) categories (*Table 2*).

Table 2
Socio-demographic characteristics and use of digital devices among university students (N=326)

Socio-demographic Characteristics	*Daily use of digital devices*			*Total*
	TV	*Computer*	*Laptop*	
Age (years)				
20-30	26(14.1)	12(12.2)	40(13.6)	51(15.64)
31-40	107(57.8)	57(58.2)	170(57.6)	187(57.36)
≥41-60	52(28.1)	29(29.6)	85(28.8)	88(26.99)
Gender				
Male	159(85.9)	86(87.8)	259(87.8)	281(86.2)
Female	26(14.1)	12(12.2)	36(12.2)	45(13.8)
Profession				
Teaching	146(78.9)	63(64.3)	218(73.9)	239(73.3)
Non-teaching	39(21.1)	35(35.7)	77(26.1)	87(26.7)
Distance of Digital devices				
< 1 ft.	44(23.8)	24(24.5)	74(25.1)	84(25.8)
1 ft. to 2 ft.	113(61.1)	52(53.1)	176(59.7)	193(49.2)
2 ft. to 3 ft.	25(13.5)	18(18.4)	38(12.9)	41(12.6)
≥ 3 ft.	3(1.6)	4(4.1)	7(2.4)	8(2.5)
Purpose of using DD				
Academic activities	162(87.6)	87(88.8)	262(88.8)	281(86.2)
Non-academic activities	23(12.4)	11(11.2)	33(11.2)	45(13.8)
Job Experience				
≤10 years	89(48.1)	46(46.9)	135 (45.8)	156(47.9)

>10 years	89(48.1)	47(48)	144 (48.8)	152(46.6)
Not specified	7(3.8)	5(5.1)	16(5.4)	18(5.5)
Take tablets/drink				
Yes	80(43.2)	47(48)	116(39.3)	128(39.3)
No	105(56.8)	51(52)	179(60.7)	198(60.7)
Sitting arrangement				
Sitting on chair/tool	121(65.4)	62(63.3)	187(63.4)	202(62.0)
Sitting on bed	28(15.1)	15(15.3)	58(19.7)	66(20.2)
Lying on bed	16(8.6)	07(7.1)	17(5.8)	24(7.4)
Sitting with laptop on lap	20(10.8)	14(14.3)	33(11.1)	34(10.4)
Total	185(100)	98(100)	295(100)	326(100)

3.3. Association between socio-demographic characteristics and mental health problems

3.3.1. Association between socio-demographic characteristics and sense of control

The range of participants having the sense of control problem is 45.3% to 53.3% in most categories of social-demographic variables except regarding distance of digital devices greater than or equal to 3 feet (62.5%). The Chi-square test statistics showed that no association was found between sense of control with all socio-demographic characteristics (*Table 3*).

3.3.2. Association between socio-demographic characteristics and loneliness

We found the loneliness problem to be high for those sitting with a laptop on their lap (61.8%) and low on those using the devices with the distance more or equal to 3 feet (25%), and for another character that frequency was found to be in the range from 34.1% to 47.6%. In all socio-demographic variables, p-value > 0.05 with loneliness problems indicates insignificant results (*Table 3*).

3.3.3. Association between socio-demographic characteristics and anxiety

Device users who sat with a laptop on their lap have the highest proportion of anxiety (44.1%). Around a fifth of the users, those maintaining a distance of 2 feet to 3 feet (22%) and aged 41–60 years, had an anxiety rate of around a fourth (21.6%) whereas that rate is also around a fourth among those aged 20–30 (25.5%). Users for non-academic activities (26.4%), > 10 years experienced (27.6%) participants and users by sitting on the bed (28.2%) and that proportion is a third of the remaining characters. Furthermore, the association is significant between anxiety and age only (*Table 3*).

3.3.4. Association between socio-demographic characteristics and depression

Proportion is very poor among those using digital devices by the distance of ≥ 3 feet with depression and high in those using devices by sitting with a laptop on lap (32.4%) where that rate is ranged from 16.8% to 28.8% in other categories. The chi-square result is insignificant between all socio-demographic variables and depression (*Table 3*).

Table 3
Association of socio-demographic characteristics with mental health problem (N = 326)

	Sense of control		*Loneliness*		*Anxiety*		*Depression*	
	Yes n(%)	*p-value*	*Yes n(%)*	*p-value*	*Yes n(%)*	*p-value*	*Yes n(%)*	*p-value*
Age (years)								
20-30	25(49)	0.91	19(37.3)	0.45	13(25.5)	0.03*	9(17.6)	0.17
31-40	87(46.5)		80(42.8)		68(36.4)		47(25.1)	
41-60	43(48.9)		31(35.2)		19(21.6)		14(15.9)	
Gender								
Male	131(46.6)	0.40	112(39.9)	0.98	86(30.6)	0.95	59(21.0)	0.60
Female	24(53.3)		18(40.0)		14(31.1)		11(24.4)	
Profession								
Teaching	116(48.5)	0.55	92(38.5)	0.40	77(32.2)	0.32	53(22.2)	0.61
Non-teaching	39(44.8)		38(43.7)		23(26.4)		17(19.5)	

Distance of Digital devices								
< 1 ft.	40(47.6)	0.86	40(47.6)	0.31	27(32.1)	0.60	20(23.8)	0.79
1 ft. to 2 ft.	91(47.2)		74(38.3)		62(32.1)		39(20.2)	
2 ft. to 3 ft.	19(46.3)		14(34.1)		9(22.0)		10(24.4)	
≥ 3 ft.	5(62.5)		2(25.0)		2(25.0)		1(12.5)	
Purpose of using DD								
Academic activities	133(47.3)	0.85	113(40.2)	0.77	88(31.3)	0.53	61(21.7)	0.80
Non-academic activities	22(48.9)		17(37.8)		12(26.7)		9(20.0)	
Job Experience								
≤10 years	80(51.3)	0.30	66(42,3)	0.27	53(34.0)	0.23	38(24.4)	0.33
>10 years	69(45.4)		55(36.2)		42(27.6)		30(19.7)	
Take tablets/drink								
Yes	58(45.3)	0.52	53(41.4)	0.65	41(32.0)	0.67	33(25.8)	0.13
No	97(49.0)		77(38.9)		59(29.8)		37(18.7)	
Seating position								
Sitting on chair/tool	35(53.0)	0.79	25(37.9)	0.04*	20(30.3)	0.32	19(28.8)	0.07
Sitting on bed	94(46.5)		73(36.1)		57(28.2)		34(16.8)	
Lying on bed	10(47.1)		11(45.8)		8(33.3)		6(25.0)	
Sitting with laptop on lap	16(47.1)		21(61.8)		15(44.1)		11(32.4)	
Total	155(47.5)		130(39.9)		100(30.7)		70(21.5)	

*p-value <0.05 (i.e., Significant).

3.4. Association of mental health problems with daily use of digital devices among university students

Table 4 shows the association between use of digital devices and mental health problems. We observed a significant association for computer use with all types of mental health problems; i.e., sense of control ($p < 0.05$), loneliness ($p < 0.05$) and anxiety ($p < 0.05$) – except for depression ($p > 0.05$). Moreover, use of TVs and were not associated with any of the mental health problems; i.e. sense of control,

loneliness, anxiety and depression ($p > 0.05$). About half of the respondents exhibited a problem with the sense of control by using TVs (50.3%), computers (56.1%) and laptops (47.5%). Around a third of the respondents demonstrated problems of loneliness and anxiety via the use of digital devices and near to one-fifth respondents were facing depression problems through using TVs (20.5%), computers (26.5%) and laptops (21.0%). In the comparison of all mental problems, the use of computers and TV are more affecting factors than the use of laptops.

Table 4
Mental health problems associated with the use of digital devices among university students (N = 326)

Mental health problems	*Responses*	*Daily use of digital devices (yes, %)*		
		TV (N = 185)	*Computer (N = 98)*	*Laptop (N = 295)*
Sense of control (n = 155)	Yes	93(50.3)	55(56.1) *	140(47.5)
Loneliness (n = 130)	Yes	69(37.3)	47(48.0) *	115(39.0)
Anxiety (n = 100)	Yes	58(31.4)	35(35.7) *	89(30.2)
Depression (n = 70)	Yes	38(20.5)	26(26.5)	62(21.0)

*p-value <0.05 (i.e., Significant).

3.5. Effect of using digital devices on mental health problems

Binary logistic regression was performed to assess the effect of using digital devices on mental health problems (sense of control, loneliness, anxiety and depression). The model covered twelve dependent variables (years of using laptop, computer and TV, preferred time to use laptop, computer and TV, sitting position while using digital devices (DD), use of tablets and drink during the use of digital devices, distance of digital devices, and pattern of using laptop, computer and TV. Nagelkerke's R-squared was used for analysis of model fit. The values higher than 60% for all the mental health problems (sense of control, loneliness, anxiety and depression) indicate a very good model fit (*Table 5*).

For sense of control, only three variables viz use of computer 2–3 times a week (Odds Ratio = 2.80), daily use of computer (Odds Ratio = 2.73), and use of TV 2–3 times a week (Odds Ratio = 0.40), made unique statistically significant contributions to the model. Computer use 2–3 times a week indicated that the

respondent using a computer 2–3 times a week had around 3 (Odds Ratio = 2.8) times more sense of control problem then those using computer <3 times a week. In case of loneliness, only three variables made a statistically significant contribution: i.e.: use of laptop at evening and night and daily use of computer made statistically significant contribution to the model where laptop use at night had around 3 times (Odds Ratio = 3.37) more loneliness than those using a laptop in the morning. With respect to anxiety, none of the predictors are significant; however, the use of digital devices via sitting on a chair is a main predictor of depression and it showed that those using digital resources by sitting in bed have twice the depression problem compared to those users who sit on a chair or tool (Odds Ratio = 0.46).

Table 5
Effect of using digital devices on mental problem (N = 326)

Variables	*Sense of control*	*Loneliness*	*Anxiety*	*Depression*
	Odds Ratio(95%CI)	*Odds Ratio(95%CI)*	*Odds Ratio(95%CI)*	*Odds Ratio(95%CI)*
Use of laptop by < 4 years	Reference	Reference	Reference	Reference
Use of laptop by 4-8 years	1.42(0,74-2,71)	0.90(0.47-1.75)	1.14(0.55-2.36)	0.58(0.27-1.25)
Use of laptop by ≥ 8 years	0.978(0.42-2.27)	0.78(0.33-1.86)	1.55(0.63-3.85)	0.55(0.19-1.57)
Use of computer by < 4 years	Reference	Reference	Reference	Reference
Use of computer by 4-8 years	0.92(0.44-1.93)	1.24(0.58-2.67)	1.74(0.74-4.07)	1.32(0.54-3.20)
Use of computer by ≥ 8 years	0.64(0.29-1.40)	1.57(0.70-3.53)	2.02(0.81-5.02)	1.21(0.45-3.30)
Use of TV by < 4 years	Reference	Reference	Reference	Reference
Use of TV by 4-8 years	0.87(0.35-2.18)	1.45(0.56-3.73)	0.93(0.33-2.62)	0.84(0.29-2.46)
Use of TV by ≥8 years	0.75(0.33-1.72)	1.42(0.61-3.31)	0.91(0.36-2.29)	0.86(0.32-2.31)
Use of laptop at morning	Reference	Reference	Reference	Reference
Use of laptop at day	0.66(0.23-1.89)	2.50(0.77-8.14)	1.30(0.42-3.99)	0.83(0.25-2.72)
Use of laptop at evening	0.69(0.26-1.87)	3.35*(1.08-10.14)	1.56(0.53-4.58)	1.07(0.35-3.22)
Use of laptop at night	1.16(0.39-3.48)	3.37*(0.99-11.44)	1.15(0.35-3.85)	0.65(0.18-2.33)
Use of computer at morning	Reference	Reference	Reference	Reference
Use of computer at day	0.97(0.41-2.30)	1.76(0.68-4.54)	1.64(0.54-4.99)	2.45(0.68-8.81)

Use of computer at evening	0.60(0.23-1.57)	1.36(0.49-3.77)	2.68(0.84-8.51)	3.05(0.80-11.60)
Use of computer at night	0.94(0.36-2.42)	1.73(0.62-4.79)	1.89(0.57-6.19)	2.29(0.58-9.15)
Use of TV at morning	Reference	Reference	Reference	Reference
Use of TV at day	1.50(0.37-6.12)	2.20(0.51-9.50)	1.56(0.34-7.26)	3.11(0.69-14.02)
Use of TV at evening	2.25(0.97-5.18)	0.94(0.39-2.23)	0.10(0.39-2.55)	0.75(0.28-1.99)
Use of TV at night	1.21(0.54-2.70)	1.21(0.53-2.80)	1.16(0.47-2.87)	0.80(0.31-2.05)
Use by sitting on bed	Reference	Reference	Reference	Reference
Use by sitting on chair/tool	0.76(0.40-1.43)	0.93(0.49-1.74)	0.76(0.39-1.49)	0.46*(0.22-0.95)
Use by lying on bed	0.41(0.14-1.19)	1.31(0.46-3.73)	0.84(0.28-2.55)	0.92(0.29-2.96)
Use by sitting with laptop on lap	0.70(0.27-1.77)	2.24(0.90-5.57)	1.38(0.54-3.51)	1.11(0.41-2.96)
Take tablets/drink	0.75(0.45-1.24)	1.22(0.74-2.02)	1.11(0.65-1.88)	1.71(0.94-3.10)
Use of DD by <1 ft.	Reference	Reference	Reference	Reference
Use of DD by 1-2 ft.	1.01(0.57-1.79)	0.71(0.40-1.26)	1.01(0.55-1.84)	1.03(0.52-2.03)
Use of DD by 2-3 ft.	0.83(0.36-1.93)	0.50(0.21-1.19)	0.59(0.23-1.53)	1.15(0.43-3.07)
Use of DD by ≥ ft.	1.59(0.31-8.20)	0.23(0.04-1.44)	0.97(0.17-5.66)	0.46(0.04-5.02)
Use of laptop < 3 times/week	Reference	Reference	Reference	Reference
Use of laptop 2-3 times/week	1.00(0.16-6.19)	2.87(0.45-18.35)	0.95(0.09-9.63)	0.53(0.04-7.33)
Use of laptop daily	1.05(0.41-2.68)	1.90(0.75-4.79)	2.02(0.77-5.30)	1.38(0.49-3.88)
Use of computer < 3 times/week	Reference	Reference*	Reference	Reference
Use of computer 2-3 times/week	2.80*(1.43-5.46)	1.02(0.52-2.01)	1.77(0.88-3.55)	1.01(0.45-2.26)
Use of computer daily	2.73*(1.45-5.14)	2.04*(1.08-3.84)	1.67(0.86-3.25)	1.63(0.78-3.39)
Use of TV < 3 times/week	Reference	Reference	Reference	Reference
Use of TV 2-3 times/week	0.40*(0.17-0.92)	1.27(0.56-2.86)	1.62(0.68-3.85)	1.46(0.57-3.72)
Use of TV daily	0.79(0.44-1.42)	0.74(0.41-1.34)	1.12(0.63-2.27)	0.88(0.43-1.08)

*p-value <0.05 (i.e., Significant).

3.6. Pattern of self-care for mental health problems among university students

Table 6 shows that most of the respondents who have mental health problems and who are not using medicine or meditation exhibit a higher degree in sense of control (74.2%), loneliness (76.2%), anxiety (73%) and depression (64.3%).

Table 6
Pattern of treatment for university students having mental health problems (N = 326)

Mental health problem	*Using medicine (%)*	*Meditations (%)*	*Taking rest (%)*	*No treatment (%)*	*No response (%)*
Sense of control (n = 155)	26 (16.8)	5 (3.2)	38 (24.5)	77 (49.7)	9 (5.8)
Loneliness (n = 130)	23 (17.7)	4 (3.1)	37 (28.5)	62 (47.7)	4(3.1)
Anxiety (n = 100)	21 (21)	4 (4)	31 (31)	42(42)	2 (2)
Depression (n = 70)	21 (30.0)	1 (1.4)	17 (24.3)	28 (40.0)	3 (4.3)

4. Discussion

This study is primarily focused on investigating mental health behaviour and self-care patterns of Nepalese students having access to the use of digital devices. One-third of the participants in the study suffered from addiction by excessive use of digital devices. The excessive users of TVs, computers, and laptops faced the problems of loneliness and anxiety while one-fifth of them were facing the problems of depression. However, the percentages of depression by the excessive use of digital devices among students vary considerably (Morahan-martin & Schumacher 2000; Yang et al. 2005). Morahan-Martin and Schumacher (2000) found that 8.1% of US college students showed symptoms of addiction (Johansson & Gotestam 2004). Yang and colleagues (2005) identified 4.9% of Korean senior high school students as excessive users of digital devices. They also reported that the incidence rate of internet addiction among Norwegian youth was 1.98%. Our research also studied the impact of socio-demographic aspects in terms of age, gender, and profession on digital device use. In our study, the male to female ratio for the use of digital devices came to 6.24:1 (281 male and 45 females), which is higher than in other similar studies.

Bloomquist and colleagues (2016) found 35.3% to have mental health problems among social workers on a survey, and CCMH (2019) found that the rate of depression and anxiety have increased by 1.59–1.81% and 1.61–1.87% during the

ten years 2010–2019 among university students respectively, where 55–62% had anxiety and 45–50% had a depression problem from 2013–2019. The change rate of mental health problems among college and university students stands high in the US as well as in other countries (Prince 2015). Even that proportion is comparatively low compared to our research where the proportion of having sense of control is 47.5%, loneliness is 39.9%, anxiety is 30.7%, and depression is 21.5%. The cause may be that the participants of this research were digitally literate and have high academic qualifications.

Significant associations were found between sitting position and loneliness, as well as age and anxiety in this study. Baker and colleagues (2018) found acute negative effects from prolonged sitting with increases in discomfort in the low back and hip/-thigh-buttock areas and cognitive function, with some deterioration in creative problem solving, and suggests that sitting for prolonged periods may have consequences for musculoskeletal discomfort and cognitive function. However, Brink and colleagues (2020) did not find any association between over-time-change in sitting posture and psychosocial factors, which might be due to the sample consisting of school children.

Moreover, binary logistic regression showed that the use of computers 2–3 times a week is the main predictor for the sense of control. Similarly, laptop use in the evening is the main predictor of loneliness, while sitting on a chair or stool during digital resource use is the main predictor of depression.

Brenner (1997) and Tsai and Lin (2003) report that younger users are more likely to be vulnerable to excessive use of digital devices as they pay more attention, while the people of the adult age groups will be more easily exhausted by the use of them. In contrast to the research, our endeavors showed the opposite relationship between the use of digital devices and their ages. The study showed people of younger age (20–30) to be less susceptible (15.64 %) to digital device use compared to adults (31–40). Auerbach and colleagues (2018) reported that around 20–35% students need mental health treatment. CCMH (2019) found that the average rate of treatment for mental health in 2010–2019 was 46-56% by counselling and 31.3–34.8% by medication among college students. Even that rate was found to be very low in this study, which indicates that users of digital devices are not serious, careful, and sensitive about their health care in the Nepalese context; however, effective services for mental health in the medical sector are not sufficient in Nepal (Angdembe et al. 2017). Vidourek and Burbage (2019), through a structured interview, found that education, treatment measures, and awareness programs are key factors to reducing mental health problems among university students. And by their experimental study, Nozawa and colleagues (2019) approved peer-counselling as an effective measure for controlling mental health problems. Bhattarai (2020) showed that 3.4% of Nepalese have a depression problem.

5. Conclusion

This study found that digital device use produces an adverse effect on mental health. The study also pointed out mental health problems such as loneliness, anxiety, and depression that stood relatively high among the subjects who used computers and TV as compared to subjects who used a laptop. Similarly, significant associations were found between one's sitting position and loneliness, age and anxiety, and daily use of computers and a sense of control, loneliness, and anxiety. Computer use 2–3 times a week is the main predictor of sense of control, use of laptop in the evening is the main predictor of loneliness and sitting on a chair or tool during digital device use is the main predictor of depression. The total percentage of participants having mental health problems measured, who were taking medicine and mediation, is only around one-fourth. This indicates that almost all participants are not careful about their mental health problems. However, the research is limited by a single institutional context and further investigation is needed to determine whether these findings apply to the people of other disciplines and across educational contexts. Moreover, this study lacks some important factors like quality of vision, screen size, screen lighting and slope that affects the mental health of the participants. Therefore, awareness programs should be implemented by the government or the non-government sector to reduce loneliness, anxiety, and depression. Additionally, related stakeholders should develop and implement self-care, wellbeing, and other related conscious programs through the social media and university curriculum as well as official sites. Information regarding the safe use of digital devices should be communicated at the university level through a proper use of behaviour change communication.

References

Angdembe, M., B.A. Kohrt, M. Jordans, D. Rimal & N.P. Luitel (2017) 'Situational Analysis to Inform Development of Primary Care and Community-Based Mental Health Services for Severe Mental Disorders in Nepal', *International Journal of Mental Health Systems* 11(69), 1–16 (https://doi.org/10.1186/s13033-017-0176-9).

Auerbach, R.P., P. Mortier, R. Bruffaerts, J. Alonso, C. Benjet, P. Cuijpers, K. Demyttenaere, D.D. Ebert, J.G. Green, P. Hasking, E. Murray, M.K. Nock, S. Pinder-Amaker, N.A. Sampson, D.J. Stein, G. Vilagut, A.M. Zaslavsky, R.C. Kessler & WHO WMH-ICS Collaborators (2018) 'WHO World Mental Health Surveys International College Student Project: Prevalence and Distribution of Mental Disorders', *Journal of Abnormal Psychology* 127(7), 623–38 (https://doi.org/10.1037/abn0000362).

Baker, R., P. Coenen, E. Howie, A. Williamson & L. Straker (2018) 'The Short Term Musculoskeletal and Cognitive Effects of Prolonged Sitting During Office Computer Work', *International Journal of Environmental Research and Public Health* 15(8), 1678 (https://doi.org/10.3390/ijerph15081678).

Bhattarai, S. (2020) 'Nepal's Suicide Rate Vastly Underestimated', *Nepali Times* (10 Jan), retrieved 12 Oct 2021 from https://www.nepalitimes.com/here-now/nepals-suicide-rate-vastly-underestimated/.

Bloomquist, K.R., L. Wood, K. Friedmeyer-Trainor & H.-W. Kim (2016) 'Self-Care and Professional Quality of Life: Predictive Factors Among MSW Practitioners', *Advances in Social Work* 16(2), 292–311 (https://doi.org/10.18060/18760).

Bonsu, A.S., J.S. Yendork & E. Teye-Kwadjo (2020) 'The Influence of Caregiver Stress and Affiliate Stigma in Community-Based Mental Health Care on Family Caregiver Wellbeing', *International Journal of Mental Health* 49(1), 35–55 (https://doi.org/10.1080/00207411.2020.1717053).

Brenner, V. (1997) 'Psychology of Computer Use: XLW. Parameters of Internet Use, Abuse and Addiction: The First 90 Days of the Internet Usage Survey', *Psychological Reports* 80(3), 879–82 (https://doi.org/10.2466/pr0.1997.80.3.879).

Brink, Y., Q. Louw & K. Grimmer (2020) 'Do Changes in Psychosocial Factors, Lifestyle Factors and Sitting Posture Influence the Likelihood of Musculoskeletal Pain in High School Computer Users?', *Physiotherapy Research International* 25(4), e1875 (https://doi.org/10.1002/pri.1865).

CCMH (2019) *Annual Report: Center for Collegiate Mental Health*, retrieved 12 Oct 2021 from https://ccmh.psu.edu/assets/docs/2019-CCMH-Annual-Report_3.17.20.pdf.

Chou, C., L. Condron & J.C. Belland (2005) 'A Review of the Research on Internet Addiction', *Educational Psychology Review* 17, 363–88 (https://doi.org/10.1007/s10648-005-8138-1).

Chou, C. & M.-C. Hsiao (2000) 'Internet Addiction, Usage, Gratification, and Pleasure Experience: The Taiwan College Students' Case', *Computers & Education* 35(1), 65–80 (https://doi.org/10.1016/S0360-1315(00)00019-1).

Christakis, D.A., M.M. Moreno, L. Jelenchick, M.T. Myaing & C. Zhou (2011) 'Problematic Internet Usage in US College Students: A Pilot Study', *BMC Medicine* 9, 77 (https://doi.org/10.1186/1741-7015-9-77).

Colizzi, M., A. Lasalvia & M. Ruggeri (2020) 'Prevention and Early Intervention in Youth Mental Health: Is it Time for a Multidisciplinary and Trans- Diagnostic Model for Care?', *International Journal of Mental Health Systems* 14, 23 (https://doi.org/10.1186/s13033-020-00356-9).

Crumb, L., T.M. Mingo & A. Crowe (2019) ' "Get Over it and Move on" : The Impact of Mental Illness Stigma in Rural, Low-Income United States Populations', *Mental Health & Prevention* 13, 143–48 (https://doi.org/10.1016/j.mhp.2019.01.010).

Fu, K-W., W.S.C. Chan, P.W.C. Wong & P.S.F. Yip (2010) 'Internet Addiction: Prevalence, Discriminant Validity and Correlates Among Internet Addiction: Prevalence, Discriminant Validity and Correlates among Adolescents in Hong Kong', *The British Journal of Psychiatry* 196(6), 486–92 (https://doi.org/10.1192/bjp.bp.109.075002).

Gowthami, S. & S. Venkatakrishnakumar (2016) 'Impact of Smartphone: A Pilot Study on Positive and Negative Effects', *International Journal of Scientific Engineering and Applied Science* 2(3), 473–78, retrieved 12 Oct 2021 from http://ijseas.com/volume2/v2i3/ijseas20160353.pdf.

Hoekstra, A.R. (2009) *A Socio-Cultural Analysis of the Use of Clickers in Higher Education,* ERIC Number: ED530461 (ProQuest LLC, Ph.D. dissertation, University of Colorado at Boulder).

Johansson, A. & K.G. Götestam (2004) 'Internet Addiction: Characteristics of a Questionnaire and Prevalence in Norwegian Youth (12–18 Years)', *Scandinavian Journal of Psychology* 45(3), 223–29 (https://doi.org/10.1111/j.1467-9450.2004.00398.x).

Kenny, A., V. Dickson-Swift, M. Gussy, S. Kidd, D. Cox, M. Masood, D. Azul, C. Chan, B. Christian, J. Theobold, B. Hodge, R. Knevel, C. Mckinstry, D. Couch, N. Hyett, P. Veginadu & N. Doroud (2020) 'Oral Health Interventions for People Living with Mental Disorders: Protocol for a Realist Systematic Review', *International Journal of Mental Health Systems* 14*,* 24 (https://doi.org/10.1186/s13033-020-00357-8).

Laconi, S., R.F. Florence & H. Chabrol (2014) 'The Measurement of Internet Addiction: A Critical Review of Existing Scales and Their Psychometric Properties', *Computers in Human Behavior* 41, 190–202 (https://doi.org/10.1016/j.chb.2014.09.026).

Leung, L. (2004) 'Net-Generation Attributes and Seductive Properties and Internet Addiction', *Cyberpsychology & Behavior* 7(3), 333–48 (https://doi.org/10.1089/1094931041291303).

Lindsay, S., P. Bellaby, S. Smith & R. Baker (2008) 'Enabling Healthy Choices: Is ICT the Highway to Health Improvement?' *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine* 12(3), 313–31 (https://doi.org/10.1177/1363459308090051).

Lupton, D. (2017) 'Digital Health Now and in the Future: Findings From a Participatory Design Stakeholder Workshop', *Digital Health* 3, 1–17. (https://doi.org/10.1177/2055207617740018).

Mahoney, M.J. (1997) 'Psychotherapists' Personal Problems and Self-Care Patterns', *Professional Psychology: Research and Practice* 28(1), 14–16 (https://doi.org/10.1037/0735-7028.28.1.14).

Meskó, B., Z. Drobni, E. Bényei, B. Gergely & Z. Györffy (2017) 'Digital Health is a Cultural Transformation of Traditional Healthcare', *MHealth* 3, 38 (https://doi.org/10.21037/mhealth.2017.08.07).

Mesmar, S., R. Talhouk, C. Akik, P. Olivier, I.H. Elhajj, S. Elbassuoni, S. Armoush, J. Kalot, M. Balaam, A. Germani & H. Ghattas (2016) 'The Impact of Digital Technology on Health of Populations Affected by Humanitarian Crises: Recent Innovations and Current Gaps', *Journal of Public Health Policy* 37, 167–200 (https://doi.org/10.1057/s41271-016-0040-1).

Ministry of Health, Nepal; New ERA; and ICF (2017) *Nepal Demographic and Health Survey 2016* (Kathmandu: Ministry of Health, Nepal) retrieved 13 Oct 2021 from https://www.dhsprogram.com/pubs/pdf/fr336/fr336.pdf.

Morahan-Martin, J. & P. Schumacher (2000) 'Incidence and Correlates of Pathological Internet Use Among College Students', Computers *in Human Behavior* 16(1), 13–29 (https://doi.org/10.1016/S0747-5632(99)00049-7).

Nozawa, H., K. Ikegami, S. Michii, R. Sugano, H. Ando, H. Kitamura & A. Ogami (2019) 'Peer Counseling for Mental Health in Young People – Randomized Clinical Trial', *Mental Health & Prevention 14*, 1–7 (https://doi.org/10.1016/j.mph.2019.200164).

Prince, J.P. (2015) 'University Student Counseling and Mental Health in the United States: Trends and Challenges', *Mental Health & Prevention* 3(1-2), 5–10 (https://doi.org/10.1016/j.mhp.2015.03.001).

Rooij, A., & N. Prause (2014) 'A Critical Review of "Internet Addiction" Criteria with Suggestions for the Future', *Journal of Behavioral Addiction* 3(4), 203–13 (https://doi.org/10.1556/JBA.3.2014.4.1).

Rosen, L.D., K. Whaling, L.M. Carrier, N.A. Cheever & J. Rokkum (2013) 'The Media and Technology Usage and Attitudes Scale: An empirical investigation', *Comput Human Behav* 29(6), 2501–11, retrieved 13 Oct 2021 from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4338964/.

Saliceti, F. (2015) 'Internet Addiction Disorder (IAD)', *Procedia - Social and Behavioral Sciences* 191, 1372–76 (https://doi.org/10.1016/j.sbspro.2015.04.292).

Scherer, K.R. (1997) 'The Role of Culture in Emotion-Antecedent Appraisal', *Journal of Personality and Social Psychology* 73(5), 902–22 (https://doi.org/10.1037/0022-3514.73.5.902).

Select Statistical Services LTD (2019) *Population Proportion - Sample Size*, retrieved 14 Oct 2021 from https://select-statistics.co.uk/calculators/sample-size-calculator-population-proportion/.

Shaw, M. & D.W. Black (2008) 'Internet Addiction: Definition, Assessment, Epidemiology and Clinical Management', *CNS Drugs* 22, 353–65 (https://doi.org/10.2165/00023210-200822050-00001).

Sprang, G., J.J. Clark & A. Whitt-Woosley (2007) 'Compassion Fatigue, Compassion Satisfaction, and Burnout: Factors Impacting a Professional's

Quality of Life', *Journal of Loss and Trauma* 12(3), 259–80 (https://doi.org/10.1080/15325020701238093).

Tsai, C.-C. & S.S.J. Lin (2003) 'Internet Addiction of Adolescents in Taiwan: An Interview Study', *Cyber Psychology & Behaviour* 6(6), 649–52 (https://doi.org/10.1089/109493103322725432).

Vidourek, R.A. & M. Burbage (2019) 'Positive Mental Health and Mental Health Stigma: A Qualitative Study Assessing Student Attitudes', *Mental Health & Prevention* 13, 1–6 (https://doi.org/10.1016/j.mhp.2018.11.006).

Widyanto, L. & M. Griffiths (2006) ' "Internet Addiction": A Critical Review', *International Journal of Mental Health and Addiction* 4, 31–51 (https://doi.org/10.1007/s11469-006-9009-9).

Williams, I.D., T.A. Richardson, D.D. Moore, L.E. Gambrel & M.L. Keeling (2010) 'Perspectives on Self-Care', *Journal of Creativity in Mental Health* 5(3), 320–38 (https://doi.org/10.1080/15401383.2010.507700).

World Health Organisation (2014) *Preventing Suicide: A Global Imperative* (Luxembourg: WHO) retrieved 13 Oct 2021 from https://www.who.int/publications/i/item/9789241564779.

Yang, C.-K., B.-M. Choe, M. Baity, J.-H. Lee & J.-S. Cho (2005) 'SCL-90-R and 16PF Profiles of Senior High School Students with Excessive Internet Use', *The Canadian Journal of Psychiatry* 50(7) 407–14 (https://doi.org/10.1177/070674370505000704).

Young, K.S. (1998) *Caught in the Net: How to Recognize the Signs of Internet Addiction and a Winning Strategy for Recovery* (Hoboken: Wiley).

Young, K.S. & R.C. Rogers (1998) 'The Relationship Between Depression and Internet Addiction', *CyberPsychology & Behavior* 1(1), 25–28 (https://doi.org/10.1089/cpb.1998.1.25).

APPENDIX I

Mental Health Problems and Patterns of Self-Care Associated with the Use of Digital Devices among University Students

Section A

General Background

Name

Age (in years):

Gender: ( ) male ( ) female ( ) other

Qualification:

Profession: ( ) teaching ( ) non-teaching

Experience (in years):

Section B

Digital resources related information

1. Which types of digital devices do you have?

Name of device	Yes	No
Mobile		
Laptop		
Computer		
TV		

2. For how many years have you used digital devices? (Please specify the length of time you have used the digital devices)

Name of device	before 2 and less years	before 2-4 years	before 4-6 years	before 6-8 years	before 8 and more year
Mobile					
Laptop					
Computer					
TV					

3. How much time are you spending on digital devices?

Name of device	Daily	2-3 times/ week	Once a week	Seldom
Mobile				
Laptop				
Computer				
TV				

4. In which time do you prefer to use digital devices?

Name of device	Morning	Day	Evening	Night
Mobile				
Laptop				
Computer				
TV				

5. For what purpose do you use digital dives?

( ) Academic activities ( ) non-academic activities

6. How are you using digital devices?

( ) sitting on chair/tool ( ) sitting on bed ( ) lying on bed ( ) sitting with laptop on Lap

7. How far do you stand the digital devices from you?

   ( ) less than 1 ft. ( ) 1 ft. to 2 ft. ( ) 2 ft. to 3 ft. ( ) more than 3 ft.

8. While you are using a digital device, do you take tablets/ drink coffee/ drink caffeine drinks to keep awake and stay longer?

   ( ) yes ( ) no

Section C

Mental health and self-care

9. Do you believe that your mental health is affected by the use of digital devices?

Mental health problems	Yes	No
Sense of control		
Loneliness		
Anxiety		
Depression		

10. If yes, how are you treating those problems?

Treating mental health problems	Using medicine	Meditations	Taking rest	No treatment	No response
Sense of control					
Loneliness					
Anxiety					
Depression					

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LIVING IN COHOUSING COMMUNITIES

Personality Traits and Trait Emotional Intelligence

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Cohousing communities are characterized by an increased amount of exchanges in social support. Since this circumstance could be attributed to certain characteristics of their inhabitants, the aim of this study was the evaluation of personality traits and trait emotional intelligence. To this purpose, a group difference study was performed in Germany between a sample of residents in cohousing communities (n = 180) and inhabitants of common neighborhoods (n = 104). Significant differences were found that support the idea that residents of cohousing communities have higher levels of well-being and minor levels of detachment and psychoticism, as well as a lower overall score for maladaptive personality traits. We have concluded that further research is needed to examine the possible causal relationships between these findings, and to verify whether living in a cohousing community can operate as a moderator of these traits or if their inhabitants had already bore them before moving into such communities.

Keywords: cohousing communities; personality traits; trait emotional intelligence

1. Introduction

Cohousing consists of a cooperative life that emerged in Denmark in the early 1970s due to social changes, especially the aging of the population and the changed role of women in society (Fedrowitz & Gailing 2003). In subsequent years, it has spread not only throughout Denmark, Sweden and the Netherlands, but also in the United States of America (Cummings & Kropf 2020). In these communities, each family unit has an apartment or house while enjoying a common area for group meetings

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(Luscombe 2019). Hence, cohousing includes the fusion of two opposing aspects: on one hand, individual autonomy and freedom, and on the other hand, a traditional community life marked by the feelings of security and belonging (Berghäuser 2013). Due to this, cohousing communities are, in a certain way, the antithesis of the current process of individualization (Andritzky 1999). Several studies have been able to show that, in these communities, social support exchange is substantially higher than in ordinary neighborhoods (Fedrowitz 2016; Margolis & Entin 2011; Markle et al. 2015) and this is precisely the reason why Parke (2017) considers cohousing communities as extended families.

Considering that this circumstance could be traced to certain characteristics of their inhabitants, the need for a closer analysis of personality traits arose. On the one hand, Goldberg's (1990) Big Five model describes five personality traits: Openness, conscientiousness, extraversion, agreeableness and neuroticism. On the other hand, the DSM-5 establishes a taxonomy of 25 maladaptive personality facets that are ascribed to five higher-level dimensions. These are negative affectivity, detachment, antagonism, disinhibition, and psychoticism (Krueger et al. 2011). Of particular interest is that the first four domains of the DSM-5 (disinhibition, detachment, antagonism, and negative affectivity) clearly correspond to the negative (that is, socially undesirable) poles of the following four dimensions of Goldberg's (1990) Big Five: conscientiousness, extraversion, agreeableness and neuroticism. The connection between DSM-5 psychoticism and Goldberg's (1990) openness to experience, on the other hand, is less clear (Tyrer 2012).

Likewise, it is important to bear in mind that exploratory factor analysis has shown that trait emotional intelligence (or trait EI) is an independent factor of the Big Five (Petrides et al. 2007). As its components are well-being, emotionality, sociability, and self-control (Petrides 2009), it is conceivable that living in a co-housing community, which is characterized by an increased amount of social support exchange, could also promote well-being.

1.1. Present study

Although most of the research about cohousing communities maintains a sociological perspective and focuses on the aforementioned social support, it should be noted that there are some studies with a psychological approach. In a comparative study conducted in the United States, Waxman (2005) evaluated a sample of 31 residents in cohousing communities and an equivalent sample of conventional residents, and found no differences concerning personality traits, preferences, and values. Sanguinetti (2014) assessed residents of cohousing communities and their attachment to place, and Pereira and colleagues (2019) conducted a study on their connection to community and nature. Neither of these two investigations performed a comparative study with

residents in traditional neighborhoods. To conclude, Schetsche and colleagues (2020) carried out a group difference study and found that, in comparison with residents of cohousing communities, habitants of traditional neighborhoods have higher levels of compulsive, anxiety, depressive, and eating disorders, as well as more use of coping strategies that are based on social withdrawal, problem avoidance, and emotional concealment. In line with previous studies (Fedrowitz 2016; Margolis & Entin 2011; Markle et al. 2015), they also found that the habitants of cohousing communities exhibited more use of social support seeking.

These investigations and their empirical evidence of greater social support in such communities were the starting point from which the present study sought to evaluate the personality traits and the trait emotional intelligence of its residents, thus comparing its results with those of a sample of inhabitants in common neighborhoods. Although Waxman (2005) already conducted a study on personality traits, it should be mentioned that the sample size was relatively small and that this study was conducted in the United States. To our knowledge, no study has assessed the personality traits of residents in German cohousing communities.

Taking into account the increased amount of social support exchange in cohousing communities, the hypothesis was that their residents have lower levels of detachment and antagonism and, on the other hand, higher levels of sociability and well-being.

2. Methodology

2.1. Sample and procedure

The non-probability sample was collected online in Germany between April 14 and May 5, 2020. To ensure anonymous participation according to the *General Data Protection Regulation* that came into force within the European Union on May 25, 2018, we used a Google Form that was created on a G-Suite account. Through the acceptance of the *Data Processing Amendment,* this account guarantees the confidential treatment of information, including fingerprints that participants leave when they fill out a form located on the servers of the aforementioned company. To corroborate the satisfactory completion of the survey, a pilot test was conducted with over 30 individuals.

To recruit residents in traditional neighborhoods, the form was spread through Facebook, and to access the sample of residents in cohousing communities, we consulted the website of the Trias Foundation, or *Stiftung trias* in German, due to its inclusion of an index of approximately 1,000 cohousing communities and their corresponding contact details. Randomly, a total number of 150 cohousing communities were selected and contacted, to inquire about their interest in taking

part in this study. Thirty-five administrators committed to forward the form link to their adult residents so that they could voluntarily participate in the survey.

Table 1 shows the sociodemographic data of the two samples, including the 284 individuals who participated: 180 of them living in cohousing communities and 104 residing in ordinary neighborhoods. In the sample of cohousing community inhabitants, the mean age was 55.14 years (SD = 13.67) and the mean age of the non-residents in cohousing communities was 39.48 years (SD = 11.74). Of all the participants who reside in cohousing communities, 123 were female (68.33%) and 56 male (31.11%) whereas 85 participants from common neighborhoods were female (81.73%) and 16 male (15.38%). Thirty-two of the cohousing participants studied between 11 and 15 years (17.78%) and 126 of them studied between 16 and 20 years (70.00%). On the other hand, 40 residents in common neighborhoods studied between 11 and 15 years (38.46%) and 51 between 16 and 20 years (49.04%). The sense of community increases with years of residence (Pretty et al. 1996) and tends to be higher among inhabitants of small cities than among residents of large cities (Prezza et al. 2001). Since the lack of sense of community is associated with the perception of health problems (Farrell et al. 2004), it was decided to include years of residence in the analysis. On average, residents of cohousing communities lived in the same place for 8.68 years and residents of traditional neighborhoods for 7.86 years.

Table 1
Sociodemographic characteristics of the two samples

		N	*Mean*	*SD*
Age	Common neighborhoods	104	39.48	11.74
	Cohousing	180	55.14	13.67
Years in living place	Common neighborhoods	104	7.86	8.03
	Cohousing	180	8.68	6.98

		Common neighborhoods	*Cohousing*
Gender	Female	85 (81.7%)	123 (68.3%)
	Male	16 (15.4%)	56 (31.1%)
	Other	3 (2.9%)	1 (0.6%)
Civil status	Single	36 (34.6%)	36 (20.0%)

	Married / Domestic partner	57 (54.8%)	107 (59.4%)
	Divorced / Separated	11 (10.6%)	34 (18.9%)
	Widower	0 (0.0%)	3 (1.7%)
Education	6-10 years	11 (10.6%)	8 (4.4%)
	11-15 years	40 (38.5%)	32 (17.8%)
	16-20 years	51 (49.0%)	126 (70.0%)
	More than 20 years	2 (1.9%)	14 (7.8%)
Number of people in the home	Alone	26 (25.0%)	54 (30.0%)
	2	32 (30.8%)	59 (32.8%)
	3	21 (20.2%)	18 (10.0%)
	4	15 (14.4%)	31 (17.2%)
	5	8 (7.7%)	6 (3.3%)
	More than 5	2 (1.9%)	12 (6.7%)

Note. SD, standard deviation.

2.2. Instruments

2.2.1. Personality Inventory for DSM-5-Brief Form – PID-5-BF

The Personality Inventory for DSM-5-Brief Form, or PID-5-BF, consists of the short version of the Personality Inventory for DSM-5, or PID-5, by Krueger and colleagues (2011). This instrument includes the five dimensions which are proposed by the DSM-5: detachment: disinhibition, antagonism, psychoticism, negative affectivity. For each of these dimensions, five items have to be answered on a 4-point Likert scale (0 = very false to 3 = very true). Zimmermann and colleagues (2014) undertook the German translation of the long version and the short version but published only the psychometric values of the former. In a study by Wissing and Reinhard (2017), who used this brief version of the inventory, internal consistencies were found between $.77 \geq \alpha \geq .65$.

During the pilot test of the present study, which was carried out on 30 individuals, a large number of participants expressed their desire to mark a neutral or intermediate response, for which a 5-point scale was introduced.

In the Argentinian translation and validation process of the same instrument, Sanchez and colleagues (2020) decided to use a 5-point Likert scale due to a better adaptation to the cultural context. In this study, the psychometric properties were not impaired and the authors yielded internal consistencies between $.74 \geq \alpha \geq .68$. Based on these results, it was decided to use a 5-point Likert scale (1 = does not describe me at all to 5 = describes me as I am) and not the 4-point scale, as proposed by the authors of the German translation and validation.

2.2.2. TEIQue

The *Trait Emotional Intelligence Questionnaire* (*TEIQue*) was developed by Petrides and Furnham (2001), and in the original English version, it comprises 153 items that are used to record four general dimensions in 13 sub-scales: (1) Well-being: Self-esteem, trait optimism, trait happiness; (2) Self-control: emotional regulation, stress management, impulsivity (low); (3) Emotionality: Perception of emotions, expression of emotions, trait empathy, relationships; (4) Sociability: Assertiveness, social conscience, handling of emotions. Two other facets, adaptability and self-motivation, are also included in the calculation of the global trait EI, and items are responded to on a 7-point Likert scale (1 = disagree to 7 = agree).

In addition to the original instrument, there is also a short version that only consists of 30 questions (TEIQue Short Form or TEIQue-SF). This version evaluates the same dimensions as the longer questionnaire, and Cooper and Petrides (2010) have shown its adequate psychometric properties. In the present study, we used the German short version, translated and validated by Freudenthaler and colleagues (2008) who obtained internal consistencies between $.94 \geq \alpha \geq .86$.

2.3. Data analysis

To determine the internal consistencies, Cronbach alphas (α) were calculated and the group differences were determined, on the one hand, through the Mann-Whitney-U test (according to Rosenthal and DiMatteo (2001) and Fritz and colleagues (2012), with effect size estimates for the Mann-Whitney-U test being computed with the Pearson correlation coefficient) and, on the other hand, through the multivariate analysis of variances, or MANOVA, with Bonferroni's adjustment for several comparisons (the effect size with Eta^2). As outliers might reduce the representativeness of the sample (Hair et al. 2019), extreme outliers were eliminated. In each group, we recognized six outliers that gathered more than three standard deviations from their respective mean values, causing these values to be removed from the sample. Homogeneity of variance was verified through the Levene test. For all the calculations described above, SPSS 25 was used with the probability value $p \leq .05$.

3. Results

3.1. Demographic data and their group differences

We resolved to use control variables since apparent differences had been observed concerning the demographic data of both samples. Due to the presence of data that did not follow a normal distribution and/or data with an ordinal scale, several Mann-Whitney-U tests were performed (Dinneen & Blakesley 1973). Regarding educational levels, the distribution of both groups differed, Kolmogorov-Smirnov $p < .05$ and a statistically significant difference was found between residents of cohousing communities ($M_{Rank} = 157.82$) and non-residents in these communities ($M_{Rank} = 115.99$), U = 6,603.00, Z = -4.803, $p < .001$, r = .285. As to age, the distribution of both groups did not differ, Kolmogorov-Smirnov $p = .304$ and a statistically significant difference was found between residents of cohousing communities (*Mdn* = 54.50) and non-residents (*Mdn* = 39.00), U = 3,691.00, Z = -8.505, $p < .001$, r = .505. Concerning the number of years resident in the place, the distribution of both groups differed: Kolmogorov-Smirnov $p < .05$, and a statistically significant difference was found between residents of cohousing communities ($M_{Rank} = 149.99$) and non-residents ($M_{Rank} = 129.54$), U = 8,012.000, Z = -2,028, $p = .042$, r = .120.

Due to the reasons mentioned above, age, years resident in place and educational level were used as control variables to determine group differences concerning all the dimensions that are analyzed below.

Concerning the nominal demographic data, a chi-square test was used to compare both groups regarding gender. Two expected cell frequencies stood below 5 (33.3%), so we used a Monte Carlo simulation based on 10,000 sampled tables to compute the *p* value. Results showed a significant difference concerning gender, $\chi^2(2) = 8.29$, $p = .012$, $\varphi = 0.18$. A second chi-square test was conducted to compare both groups regarding civil status. Two expected cell frequencies were below 5 (25.0%), so we used a Monte Carlo simulation based on 10,000 sampled tables to compute the *p* value. Results showed a significant difference regarding civil status, $\chi^2(3) = 9.33$, $p = .020$, $\varphi = 0.19$.

3.2. Personality traits, trait emotional intelligence, and their group differences

First, we calculated Cronbach's alphas for reliability analysis. Although some internal consistencies were below those obtained in their original studies, we can observe in *Table 2* that all the values are between moderate and high (Hinton et al. 2014).

Due to the robustness of MANOVA against violating Normality assumptions (Blanca et al. 2017; Glass et al. 1972; Harwell et al. 1992; Lix et al. 1996;

Schmider et al. 2010), we only performed the Levene test and its results showed that all dimensions had homogeneity of variances.

Among the significant differences found between residents in cohousing communities and those living in common neighborhoods, we can highlight *detachment, psychoticism*, the *PID Overall score*, and *well-being. Well-being* should be particularly emphasized since it has shown the largest effect size.

Table 2
Statistical summary of psychometric instruments

		(I) Cohousing communities		*(J) Common neighborhoods*		*Mean difference[b]*	*95% CI for difference[b]*				
		(n = 174)		(n = 98)		(I - J)					
	α	M	SD	M	SD		LL	UL	F	Sig.[b]	Eta[2]
Detachment	.69	1.915	.679	2.122	.693	**-.209***	-.415	-.003	3.985	.047	.015
Disinhibition	.69	1.915	.584	2.120	.677	-.081	-.262	.099	.784	.377	.003
Antagonism	.58	1.579	.457	1.629	.487	-.063	-.203	.078	.766	.382	.003
Psychoticism	.74	1.980	.670	2.231	.747	**-.238***	-.448	-.029	5.016	.026	.018
Negative affectivity	.65	2.240	.625	2.531	.678	-.087	-.275	.102	.818	.367	.003
PID Overall score	.85	1.926	.394	2.127	.476	**-.135***	-.262	-.009	4.472	.035	.016
Well-being	.82	5.681	.909	5.395	1.003	**.345***	.062	.628	5.748	.017	.021
Self-control	.63	5.166	.788	4.903	.787	.103	-.131	.337	.750	.387	.003
Emotionality	.69	5.267	.818	5.171	.861	.141	-.109	.391	1.235	.267	.005
Sociability	.58	4.737	.769	4.667	.815	.056	-.180	.293	.218	.641	.001
TEIQue Overall score	.87	5.235	.589	5.048	.650	.159	-.024	.343	2.921	.089	.011

Notes. *The mean difference is significant at the .05 level and is based on estimated marginal means; b, Adjustment for multiple comparison: Bonferroni; M, mean; SD, standard deviation; CI, confidence interval; LL, lower limit; UL, upper limit.

3.3. Correlations

As data did not follow a normal distribution, Spearman correlations were computed. *Table 3* shows the associations between the *PID* and *TEIQue* dimensions. Numerous

significant correlations were found, so that only those moderate and strong correlations will be highlighted in which significant differences have been found between both samples. Of these dimensions, *detachment* stands out, since it contains the factor with the highest correlations, especially with *well-being, emotionality*, and the *TEIQue Overall score*. Second in relevance is the *PID Overall score* due to its correlations with *well-being, self-control* and the *TEIQue Overall score*. Finally, *psychoticism* showed a moderate negative correlation with *self-control* and the *TEIQue Overall score* (Cohen 1988).

Table 3
Spearman correlations

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
(1) Detachment	1									
(2) Disinhibition	,318**	1								
(3) Antagonism	,241**	,278**	1							
(4) Psychoticism	,375**	,372**	,333**	1						
(5) Negative affectivity	,397**	,325**	,306**	,325**	1					
(6) PID Overall score	,686**	,662**	,575**	,723**	,680**	1				
(7) Well-being	-,502**	-,241**	-,211**	-,286**	-,492**	-,516**	1			
(8) Self-control	-,329**	-,359**	-,228**	-,322**	-,614**	-,545**	,523**	1		
(9) Emotionality	-,545**	-,242**	-,298**	-,223**	-,215**	-,442**	,376**	,195**	1	
(10) Sociability	-,368**	-,164**	,001	-,245**	-,266**	-,309**	,394**	,332**	,480**	1
(11) TEIQue Overall score	-,605**	-,359**	-,294**	-,398**	-,537**	-,644**	,764**	,670**	,716**	,705**

Notes. **. Correlation is significant at the .01 level (2-tailed); *. Correlation is significant at the .05 level (2-tailed).

4. Discussion and conclusion

To determine the existence of discrepancies between the inhabitants of cohousing communities and residents of common neighborhoods, 11 dimensions were evaluated. In four of them, we found significant differences showing that the sample of cohousing residents had higher levels of well-being and lower levels of detachment, psychoticism, and the overall score of maladaptive personality traits. In the remaining seven dimensions, no significant differences were found.

Although the relationship between lower levels of psychoticism and residence in a cohousing community is not so conclusive, the parallel between cohousing and decreased levels of detachment is in line with the hypothesis based on the increased number of social support exchanges (Markle et al. 2015). This correspondence is more evident when considering Krueger and colleagues' (2011) definition of detachment, characterizing it through its facets of social withdrawal, avoidance of closeness, anhedonia, depression, limited emotional experience, and mistrust. Accordingly, it is striking that no significant differences have been found concerning sociability. Furthermore, it could be shown that detachment is the dimension with the most significant negative correlation with well-being, thus forming a key trait that can hinder the achievement of increased psychological well-being.

On the other hand, it should also be mentioned that the correlations, although statistically significant, do not allow us to establish a causal relationship between the facts previously described. It is arguable, therefore, whether living together in a cohousing community stands as a key factor in the development of lower levels of detachment, or if the residents of such communities already enjoyed these traits before moving into them.

In the present study, it has been possible to go one step further towards understanding a particular characteristic of cohousing communities' inhabitants, and the decreased levels of detachment may be a factor that not only helps to increase psychological well-being but also reduces vulnerability to certain syndromes, such as avoidant, schizoid, and histrionic disorder (Kotov et al. 2017).

Despite the results found, it should be noted that these are not completely in line with previous research: Waxman's (2005) study revealed no significant differences concerning extraversion, which could be because the sample size of her investigation was considerably smaller. Likewise, it is important to bear in mind that, in the present study, a non-probability sampling was carried out and that the sample size can be considered relatively small, making it difficult to generalize its results. In addition, it should be noted that the sample was drawn online using non-probabilistic sampling, thus future studies should replicate its results in field studies.

In summary, the present study has shown that residents of cohousing communities have, from various points of view, lower levels of maladaptive personality traits and a higher level of well-being. Although these results are favorable, further research is necessary to verify whether living in a cohousing community can operate as a moderator of these traits or if its inhabitants had already enjoyed them before moving into the community. This question could be clarified through future investigations that deepen the study of such communities and evaluate the causal relationships through longitudinal studies and/or mediation analysis, as well as their effects on psychological symptoms and/or psychological well-being.

References

Andritzky, M. (1999) 'Balance zwischen Heim und Welt. Wohnweisen und Lebensstile von 1945 bis heute' in I. Flagge, ed., *Geschichte des Wohnens, Band 5: 1945 bis heute Aufbau Neubau Umbau* (/Ludwigburg/Stuttgart: Wüstenrot Stiftung & Deutsche Verlags-Anstalt) 615–86.

Berghäuser, M. (2013) *Fragen und Antworten zum gemeinschaftlichen Wohnen: Gemeinschaftliches Wohnen* (Darmstadt: Schader-Stiftung) retrieved 2 Oct 2021 from https://www.schader-stiftung.de/fileadmin/content/2013_Gemeinschaftliches_wohnen_FAQ.pdf.

Blanca, M.J., R. Alarcón, J. Arnau, R. Bono & R. Bendayan (2017) 'Non-Normal Data: Is ANOVA Still a Valid Option?', *Psicothema* 29(4), 552–57 (https://doi.org/10.7334/psicothema2016.383).

Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences* (2nd ed., New York: Lawrence Erlbaum).

Cooper, A. & K.V. Petrides (2010) 'A Psychometric Analysis of the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue–SF) Using Item Response Theory', *Journal of Personality Assessment* 92(5), 449–57 (https://doi.org/10.1080/00223891.2010.497426).

Cummings, S. & N.P. Kropf (2020) *Senior Cohousing* (Cham: Springer) (https://doi.org/10.1007/978-3-030-25362-2).

Dinneen, L.C. & B.C. Blakesley (1973) 'Algorithm AS 62: A Generator for the Sampling Distribution of the Mann- Whitney U Statistic', *Applied Statistics* 22(2), 269–73 (https://doi.org/10.2307/2346934).

Farrell, S.J., T. Aubry & D. Coulombe (2004) 'Neighborhoods and Neighbors: Do They Contribute to Personal Well-Being?' *Journal of Community Psychology* 32(1), 9–25 (https://doi.org/10.1002/jcop.10082).

Fedrowitz, M. (2016) 'Gemeinschaftliches Wohnen – Stand und Entwicklung in Deutschland', *Nachrichten Der ARL* 1, 9–12, retrieved 2 Oct 2021 from https://shop.arl-net.de/media/direct/pdf/nachrichten/2016-1/Nachr_1-2016_Fedrowitz_S9-12_online.pdf.

Fedrowitz, M. & L. Gailing (2003) *Zusammen wohnen: Gemeinschaftliche Wohnprojekte als Strategie sozialer und ökologischer Stadtentwicklung* (Dortmund: Institut für Raumplanung, Fakultät für Raumplanung, Universität Dortmund).

Freudenthaler, H.H., A.C. Neubauer, P. Gabler, W.G. Scherl & H. Rindermann (2008) 'Testing and Validating the Trait Emotional Intelligence Questionnaire (Teique) in a German-Speaking Sample', *Personality and Individual Differences* 45(7), 673–78 (https://doi.org/10.1016/j.paid.2008.07.014).

Fritz, C.O., P.E. Morris & J.J. Richler (2012) 'Effect Size Estimates: Current Use, Calculations, and Interpretation', *Journal of Experimental Psychology: General* 141(1), 2–18 (https://doi.org/10.1037/a0024338).

Glass, G.V., P.D. Peckham & J.R. Sanders (1972) 'Consequences of Failure to Meet Assumptions Underlying the Fixed Effects Analyses of Variance and Covariance', *Review of Educational Research* 42(3), 237–88 (https://doi.org/10.3102/00346543042003237).

Goldberg, L.R. (1990) 'An Alternative "Description of Personality": The Big-Five Factor Structure', *Journal of Personality and Social Psychology* 59(6), 1216–29 (https://doi.org/10.1037/0022-3514.59.6.1216).

Hair, J.F., W.C. Black, B.J. Babin & R.E. Anderson (2019) *Multivariate Data Analysis* (8th ed., Andover: Cengage).

Harwell, M.R., E.N. Rubinstein, W.S. Hayes & C.C. Olds (1992) 'Summarizing Monte Carlo Results in Methodological Research: The One- and Two-Factor Fixed Effects ANOVA Cases', *Journal of Educational Statistics* 17(4), 315–39 (https://doi.org/10.3102/10769986017004315).

Hinton, P., I. McMurray & C. Brownlow (2014) *SPSS Explained* (2nd ed., London: Routledge) (https://doi.org/10.4324/9781315797298).

Kotov, R., R.F. Krueger, D. Watson, T.M. Achenbach, R.R. Althoff, R.M. Bagby, T.A. Brown, W.T. Carpenter, A. Caspi, L.A. Clark, N.R. Eaton, M.K. Forbes, K.T. Forbush, D. Goldberg, D. Hasin, S.E. Hyman, M.Y. Ivanova, D.R. Lynam, K. Markon, … M. Zimmerman (2017) 'The Hierarchical Taxonomy of Psychopathology (HiTOP): A Dimensional Alternative to Traditional Nosologies', *Journal of Abnormal Psychology* 126(4), 454–77 (https://doi.org/10.1037/abn0000258).

Krueger, R.F., N.R. Eaton, J. Derringer, K.E. Markon, D. Watson & A.E. Skodol (2011) 'Personality in DSM–5: Helping Delineate Personality Disorder Content and Framing the Metastructure', *Journal of Personality Assessment* 93(4), 325–31 (https://doi.org/10.1080/00223891.2011.577478).

Lix, L.M., J.C. Keselman & H.J. Keselman (1996) 'Consequences of Assumption Violations Revisited: A Quantitative Review of Alternatives to the One-Way Analysis of Variance F Test', *Review of Educational Research* 66(4), 579–619 (https://doi.org/10.3102/00346543066004579).

Luscombe, G. (2019) 'Cohousing' in D. Gu & M. Dupre, eds., *Encyclopedia of Gerontology and Population Aging* (Cham: Springer) (https://doi.org/10.1007/978-3-319-69892-2_738-1).

Margolis, D. & D. Entin (2011) *Report on Survey of Cohousing Communities 2011*, retrieved 2 Oct 2021 from http://oldsite.cohousing.org/node/2023.

Markle, E.A., R. Rodgers, W. Sanchez & M. Ballou (2015) 'Social Support in the Cohousing Model of Community: A Mixed-Methods Analysis', *Community Development* 46(5), 616–31 (https://doi.org/10.1080/15575330.2015.1086400).

Parke, R.D. (2017) 'Family Psychology: Past and Future Reflections on the Field', *Journal of Family Psychology* 31(3), 257–60 (https://doi.org/10.1037/fam0000318).

Pereira, G.F., M. Lies & M. Kang (2019) 'A Case Study of Place Attachment in Rural and Urban Senior Cohousing Communities', *Housing and Society* 46(1), 3–22 (https://doi.org/10.1080/08882746.2019.1580945).

Petrides, K.V. (2009) 'Psychometric Properties of the Trait Emotional Intelligence Questionnaire (TEIQue)' in J. Parker, D. Saklofske & C. Stough, eds., *Assessing Emotional Intelligence. The Springer Series on Human Exceptionality* (Boston: Springer) 85–101(https://doi.org/10.1007/978-0-387-88370-0_5).

Petrides, K.V. & A. Furnham (2001) 'Trait Emotional Intelligence: Psychometric Investigation with Reference to Established Trait Taxonomies', *European Journal of Personality* 15(6), 425–48 (https://doi.org/10.1002/per.416).

Petrides, K.V., R. Pita & F. Kokkinaki (2007) 'The Location of Trait Emotional Intelligence in Personality Factor Space', *British Journal of Psychology* 98(2), 273–89 (https://doi.org/10.1348/000712606X120618).

Pretty, G.M.H., C. Conroy, J. Dugay, K. Fowler & D. Williams (1996) 'Sense of Community and its Relevance to Adolescents of all Ages', *Journal of Community Psychology* 24(4), 365–79 (https://doi.org/10.1002/(SICI)1520-6629(199610)24:4<365::AID-JCOP6>3.0.CO;2-T).

Prezza, M., M. Amici, T. Roberti & G. Tedeschi (2001) 'Sense of Community Referred to the Whole Town: Its Relations with Neighboring, Loneliness, Life Satisfaction, and Area of Residence', *Journal of Community Psychology* 29(1), 29–52 (https://doi.org/10.1002/1520-6629(200101)29:1<29::AID-JCOP3>3.0.CO;2-C).

Rosenthal, R. & M.R. DiMatteo (2001) 'Meta-Analysis: Recent Developments in Quantitative Methods for Literature Reviews', *Annual Review of Psychology* 52(1), 59–82 (https://doi.org/10.1146/annurev.psych.52.1.59).

Sanchez, R.O., S.A. Montes & L.D. Somerstein (2020) 'Inventario de Personalidad para el DSM-5: propiedades psicométricas en población argentina', *Interdisciplinaria Revista de Psicología y Ciencias Afines* 37(1), 55–76 (https://doi.org/10.16888/interd.2020.37.1.4).

Sanguinetti, A. (2014) 'Transformational Practices in Cohousing: Enhancing Residents' Connection to Community and Nature', *Journal of Environmental Psychology* 40, 86–96 (https://doi.org/10.1016/j.jenvp.2014.05.003).

Schetsche, C., L.C. Jaume, L. Gago-Galvagno & A.M. Elgier (2020) 'Living in Cohousing Communities: Psychological Effects and Coping Strategies in Times of COVID-19', *Interpersona: An International Journal on Personal Relationships* 14(2), 169–82 (https://doi.org/10.5964/ijpr.v14i2.4257).

Schmider, E., M. Ziegler, E. Danay, L. Beyer & M. Bühner (2010) 'Is It Really Robust? Reinvestigating the Robustness of ANOVA Against Violations of the Normal Distribution Assumption', *Methodology* 6(4), 147–51 (https://doi.org/10.1027/1614-2241/a000016).

Tyrer, P. (2012) 'Diagnostic and Statistical Manual of Mental Disorders: A Classification of Personality Disorders That Has Had Its Day', *Clinical Psychology & Psychotherapy* 19(5), 372–74 (https://doi.org/10.1002/cpp.1810).

Waxman, G.S. (2005) *Who Lives in Cohousing: Personality and Preferences of Cohousing Residents* (PhD. diss., California Institute of Integral Studies), ProQuest Dissertations Publishing, retrieved 4 Oct 2021 from https://www.proquest.com/openview/2ede2d922a129be5b1dcf703890e71df/1?pq-origsite=gscholar&cbl=18750&diss=y.

Wissing, B.G. & M.-A. Reinhard (2017) 'The Dark Triad and the PID-5 Maladaptive Personality Traits: Accuracy, Confidence and Response Bias in Judgments of Veracity', *Frontiers in Psychology* 8, 1549 (https://doi.org/10.3389/fpsyg.2017.01549).

Zimmermann, J., D. Altenstein, T. Krieger, M. Grosse Holtforth, J. Pretsch, J. Alexopoulos, C. Spitzer, C. Benecke, R.F. Krueger, K.E. Markon & D. Leising (2014) 'The Structure and Correlates of Self-Reported DSM-5 Maladaptive Personality Traits: Findings from Two German-Speaking Samples', *Journal of Personality Disorders* 28(4), 518–40 (https://doi.org/10.1521/pedi_2014_28_130).

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EXAMINATION OF COPING STRATEGIES AMONG ON-SITE PARAMEDICS**

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The occurrence of physical and psychological symptoms that negatively influence everyday activities, efficient job performance, and professional patient treatment are common among paramedic workers.
Aim: We uncovered the characteristic coping strategies applied by on-site paramedics and searched for correlations between these strategies and demographic, socio-economic characteristics, as well as factors related to work, workplace, and health behaviours.
Sample and methodology: The survey was conducted between March 1, 2018, and February 28, 2019, among employees of the DG National Ambulance Service and participants of the Chamber of Hungarian Health Care Professionals. We used an abbreviated version of the Ways of Coping Questionnaire that contains 22 items (WOC-22). Descriptive statistics, independent samples T-tests, correlation calculations, analysis of variance with the Games-Howell post-hoc test were also carried out.
Results: Tension reduction was a more common coping strategy among female and/or single paramedics as well as also being characteristic of people who work as paramedic officers. Problem-oriented coping stood out as a characteristic of people who have a higher level of education and/or are more satisfied with their financial situation. Risk-seeking appears dominantly among those who are not religious and/or have a lower level of education.
Conclusions: Although paramedics are basically characterized by problem-oriented coping strategies, they quite often apply non-adaptive strategies as well; consequently, the chance of developing anxiety remains higher for them. Our aim is to use effective intervention methods for curbing the development of anxiety conditions among the ambulance personnel that have long-lasting negative effects on health care. To achieve this goal, we recommend including a questionnaire about coping strategies into the admission process of would-be paramedics; also, completing such questionnaires among the whole emergency workforce.

Keywords: coping; ambulances; paramedics; social demography; health behaviors

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1. Introduction

In the case of healthcare workers and on-site paramedics, in particular, it is a well-known fact that they are under pronounced physical and mental burden resulting in negative emotional and physiological consequences (Betlehem et al. 2010; Pék et al. 2011; Szabó et al. 2008; Szobota & Balogh 2019). This process first leads to compensation, and as time goes on and exertion continues, compensation mechanisms become inadequate, and, as a result, physical and psychological symptoms appear. The appearance of these symptoms decreases the ability for efficient and focused work, the quality of life, and increases the occurrence of family and workplace conflicts, as well as leading to serious addictions (Bennet et al. 2004; Szabó et al. 2008; Hegedűs et al. 2008). The overview of the literature on workplace conflicts shows that the so-called group effect is most common among healthcare workers in Hungary; the group effect can be interpreted as influencing cooperation within a team or among teams (e.g., paramedics and the emergency room), leading to a decrease in trust and the deterioration of workplace and professional relationships (Csupor et al. 2017). The above-mentioned physical and psychological effects can be characterized as conflict factors for the individual leading to the establishment of coping strategies. Coping is the result of the ever-changing interaction between personal factors and environmental effects that includes the evaluation of the stress-inducing event, the availability of the possible coping capacities, and the work necessary to carry out the chosen coping strategy (Folkman & Lazarus 1980; 1985). Based on research results, the two most common coping strategies are the problem-solving approach and the emotional approach. During the problem-solving strategy, the focus is directly on eliminating and/or modifying the situation causing stress experience. On the contrary, the emotional approach strategy emphasizes the regulation of emotional responses to life situations causing stress. Scientific literature indicates that although to varying degrees, we use both strategies in stressful situations that require coping (Rózsa et al. 2008). Conflict-solving ability as one dimension of the coping process is actively present in our everyday lives. According to Rogers, the origin of conflict can be found between the individual's innate positive nature and the often unnatural effects of civilized society that are placed upon the individual (Budavári-Takács 2011, 8).

In Deutsch's interpretation (Deutsch 1973), conflicts can be divided into two large groups based on their consequences and effects. The first is constructive conflict when the process ends with positive results and satisfaction. This type of conflict increases performance, reduces tension, and helps to achieve aims.

The destructive conflict, on the other hand, leaves the participant feeling a sense of loss leading to decreased performance, defensive, or introverted, closed-off behaviour (Budavári-Takács 2011, 9). The sources of conflict are grouped into three categories: personal, interpersonal, and organizational conflicts. Our

present research framework places the emphasis foremost on the personal aspect differentiating between two subsets of this category. The first is that of personal factors, which references the fact that the individual's personality and life situation influences the conflict, and these are related to coping styles and processes. The second subcategory includes difficulties stemming from processing loss when conflict arises in connection with losses experienced during work (for example the unexpected or sudden death of a minor/adolescent) (Csupor et al. 2017; Rahim & Bonoma 1979; Leever et al. 2010).

The present research aims to uncover the coping strategies used by on-site paramedic workers and search for relationships between demographic and socio-economic characteristics of the examined sample as well as between factors related to work, workplace, health behaviours and coping strategies.

2. Methodology

2.1. Participants

Employees of the National Ambulance Service (NAS) who have been carrying out independent on-site work for at least six months (i.e., doctors, paramedic officers, paramedic technicians, paramedic nurses and paramedic drivers) participated in the study.

2.2. Data collection

Online data registration took place between March 2018 and February 2019. The questionnaire was sent to internal, closed email addresses of the NAS as well as to registered employee addresses of the National Paramedic Department in the Chamber of Hungarian Health Care Professionals (CHHCP). Of the 669 questionnaires we received, 658 could be evaluated. According to the NAS 2018 November registry data, 6,412 persons were in active employment while the questionnaire was being recorded, 88% of them were males and 12% females. The gender ratio of the study's participants was congruent with the ratio of the persons in active employment.

2.3. Tools of assessment

The abbreviated Ways of Coping Questionnaire, 22 item version (WOC-22).

We used the abbreviated version (Kopp & Skrabski 1995; Rózsa et al. 2008) of the Folkman-Lazarus questionnaire (Folkman & Lazarus 1980) applied in

epidemiological assessments to examine conflict-solving strategies. Participants could indicate on a four-tier scale (0 = not at all; 3 = completely characteristic) how characteristic the coping strategies listed in the questionnaire were of them in connection with a life situation they deemed especially difficult (e.g., the death of a child or another person that affects you severely) and if the coping strategies were characteristic of them, to what degree they applied them throughout the weeks following the event. Three main coping strategies can be determined from the questionnaire: problem-oriented, emotion-oriented, and support seeking, which can be further divided into subscales. Within the problem-oriented category, we can differentiate between problem analysis, cognitive restructuring, and adaptation subscales. Within emotional orientation, we see emotionally initiated actions, seeking emotional balance and withdrawal subscales as well as the subscale of assistance-seeking within the category of support-seeking. When analyzing the data from the examined population, new subscales were determined: tension reduction, cognitive restructuring, problem analysis and risk-seeking.

Socio-demographic variables, questions regarding the workplace, work performance and financial situations were recorded in the questionnaire as well as data regarding alcohol, coffee, and energy-drink consumption in connection with lifestyles along with questions on religious beliefs.

2.4. Statistical analysis

Descriptive statistics were used to summarise the data; we indicated mean and standard deviation for scale variables and frequency distributions for ordinal/nominal variables. To examine differences between two groups such as men and women, religious and non-religious participants, on WOC-22 subscales, we used independent samples T-test. To examine differences between more than two groups, such as level of education, marital status, place of growing up, residential environment, workplace position, monthly working hours, type of emergency vehicle, satisfaction with the financial situation, and smoking habit, on WOC-22 subscales, we used one-way ANOVA with post-hoc tests (Games-Howell). In the case of comparing means analysis, we concluded based on the results of the robust procedure (Welch). The Spearman rank correlation coefficient was calculated to study the associations between WOC-22 subscales and the following scale or ordinal variables assuming a monotonous association: age, the number of children, time spent with the NAS, consumption of coffee, alcohol, energy drinks, and doing deliberate, active exercise. We analysed our results using the IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp. Released 2017., Armonk, NY: IBM Corp.).

3. Results

3.1. Socio-demographic characteristics of the participants

In the sample (N = 669), just as in the full population of the profession, men are in a significant majority (87.6%). Participants' ages ranged from 20 to 64 years (M = 42, SD = 10.41). A third of those who answered the questionnaire (32.5%) were in the 36–45-year-old age group. Neither the youngest (< 25 years) nor the oldest (> 55 years) group reached 10%. We used eight categories to describe qualifications. During the analysis, participants were classified into three categories based on the level of qualifications: 1) having medium-level qualifications (23.1%), 2) having Bachelor's degree (36.8%), 3) having Master's and/or PhD degrees (40.1%). Most of the participants are married or live in a relationship (76.2%), 13.7% are single and 10.1% are divorced or widowed. As regards children, those with two children were in the majority (31.2%) and the ratio of childless individuals was 26.1%. Participants spent most of their upbringing in urban environments (41.2%). More than a third of the sample was raised in rural settings (36.5%). At present, the majority reside in apartments that they own (42.4%) or in detached houses with gardens that are their property (42.3%), and 16.3% live in rented apartments or detached houses with gardens. A little over half of the participants (54.2%) do not practise any religion.

3.2. Characteristics related to work and workplace

The largest percentage of NAS employees comprises paramedic nurses (46.4%) and paramedic officers (28.1%). Based on the time spent with the National Ambulance Service, participants have been working for six months to 44 years (M = 16.73 yrs, SD = 11.36); 32.9% of them have been with the NAS for 1–10 years. The majority of the sample were employed in Central Hungary (22.7%) and the Southern Great Plain Regions (18.6%).

As regards the type of emergency vehicle, we saw most employees working in emergency ambulances (45.6%) and the patient transport ambulance (42.1%). The significant majority of those who answered the questionnaire are employed full-time (86.2%), in 168 hours (Med = 168). As regards work schedules, 24-hour shifts are the most common (45.8%). When examining satisfaction with their financial situation, more than half of the respondents stated that they were moderately satisfied (62.3%), and only 18.3% indicated that they were dissatisfied.

3.3. Health behaviour, risk behaviour

A significant percentage of individuals in the sample do not smoke (67%). When we asked about coffee-drinking habits, nearly a fifth of the participants (21.6%) revealed they do not drink coffee. Most of those who drink coffee regularly, consume two to three cups of coffee a day (56.9%). 27.8% of them drink four or more cups of coffee a day. The vast majority of the participants do not consume energy drinks (89.1%). Half of the respondents do not or only rarely consume alcohol (50.7%), the ratio of respondents who consume alcohol every day or more than once a week tallied 21.9%. As regards deliberate, active exercise, those who do not or rarely exercise were in the majority, nearly half the participants (42.4%), with 6.3 percent of employees exercising daily.

3.4. WOC-22 questionnaire

The confidence interval (Cronbach's alpha) of the WOC-22 subscale in the sample of on-site paramedics stood somewhat below the range of acceptability (0.70–0.85). During the course of factor analysis, we were able to separate the following subscales: (1) *problem analysis* (questions 1,17,18,21,22) (2) *tension reduction* (questions 4,15,16,19), (3) *cognitive restructuring* (questions 8,9,10,11), (4) *risk-seeking* (questions 3,13). In the latter case, we took the fact into account that the value of Cronbach's alpha depends strongly on the item number, which means that it can even fall between 0.3–0.5. In this case, we accepted this subscale despite its lower Cronbach's alpha value.

4. Results

4.1. Relationships between coping strategies and socio-demographic characteristics

Coping strategies applied by men and women differ significantly; *tension reduction* is more common among women than men ($t(665) = -4.301$, $p < 0.001$).

Persons who consider themselves religious are more likely to apply *cognitive restructuring* in difficult life situations ($t(657) = 2.484$, $p = 0.013$), while *risk-seeking* is more common among those who are non-religious ($t(657) = -2.449$, $p = 0.015$).

Analysis of education levels showed a significant difference as regards the *problem-oriented* ($F(2,658) = 4.991$, $p = 0.007$), *tension reduction* ($F(2,658) = 7.199$, $p = 0.001$), and *risk-seeking* ($F(2,658) = 5.240$, $p = 0.006$) subscales. Based on the post-hoc test (Games-Howell) it is apparent that *problem-oriented* coping is more

common among BSc/MSc graduates than in the medium-level qualifications group. *Tension reduction* as a coping mechanism dominates among MSc graduates and *risk-seeking* was a more typical coping strategy among participants with BSc degree or medium-level qualifications.

When examining marital status, we found a significant difference as regards *tension reduction* ($F(2,653) = 7.897$, $p = 0.001$), it is more common among single persons than among divorced or widowed participants.

Age and *problem-oriented* coping strategy ($rho(663) = -0.098$, $p = 0.012$), as well as *tension reduction* ($rho(663) = -0.185$, $p < 0.001$) showed a statistically significant correlation but the effects were negligible/very small. There is no association between age and coping strategies.

A statistically significant correlation did exist, however, between the number of children and *tension reduction* ($rho(626) = -0.134$, $p < 0.001$). The effect was very small: there is no association between the number of children and coping strategies.

In further questions such as 'Where did you spend the most time growing up?', 'What sort of residential environment do you live in?', we did not find significant differences/associations on the subscales of the questionnaire (*Table 1*).

4.2. Relationships between coping strategies and work/workplace characteristics

As regards workplace position, a significant difference existed between *tension reduction* ($F(3,640) = 5.317$, $p = 0.002$) and *risk-seeking* ($F(3,640) = 3.582$, $p = 0.017$), but in the post-hoc test, a significant difference was only seen in *tension reduction*, thus we can ascertain that *tension reduction* is most characteristic of paramedic officers.

As regards monthly working hours, there was a statistically significant correlation with *tension reduction* but the effect remained negligible ($rho(652) = -0.097$, $p = 0.013$). In summary, there was a non-significant association between monthly working hours and coping strategies.

When examining satisfaction with the financial situation, we found a significant difference between examined groups (satisfied, moderately satisfied, dissatisfied) on *problem-oriented* coping strategies ($F(2,657) = 4.760$, $p = 0.009$). Participants satisfied with their financial situation showed a higher score than those moderately satisfied or dissatisfied.

Time spent working as a paramedic showed a statistically significant correlation with *problem-orientation* ($rho(636) = -0.119$, $p = 0.003$) and *tension reduction* ($rho(636) = -0.093$, $p = 0.018$). However, the correlation coefficients imply very small or negligible associations; there were no associations between time spent working as a paramedic and coping strategies.

In questions such as 'What level of care the vehicle can provide that you work in and with what kind of work schedule do you have?', we did not find significant differences/associations on the subscales of the questionnaire (*Table 1*).

4.3. Relationships between coping strategies and health/risk behaviour characteristics

Alcohol consumption and *cognitive restructuring* showed a statistically significant correlation but the correlation coefficient stood at almost zero (rho(653) = -0.083, p = 0.033). There was a non-significant association between alcohol consumption and coping strategies.

Finally, doing active, deliberate exercise showed a statistically significant association with *tension reduction* (rho(650) = -0.118, p = 0.002) and *cognitive restructuring* (rho(650) = 0.132, p < 0.001), but the effects were very small. There was a non-significant association between doing active, deliberate exercise and coping strategies.

Finally, there appears a non-significant correlation/difference between coping strategies and coffee, energy drinks consumption, as well as smoking habits (*Table 1*).

Table 1
Relationships between WOC-22 subscales and socio-demographic factors, characteristics related to work/workplace, as well as health/risk behaviours

	WOC-22 subscales			
	Problem-oriented	*Tension reduction*	*Cognitive restructuring*	*Risk-seeking*
Socio-demographic factors				
gender	ns	*x*	ns	ns
religiosity	ns	ns	*x*	*x*
education	*x*	*x*	ns	*x*
marital status	ns	*x*	ns	ns
age	ns			
number of children	ns			
place of growing up	ns			
residential environment	ns			

Work and workplace characteristics				
workplace position	ns	*x*	ns	*x*
monthly working hours	ns			
satisfaction with the financial situation	*x*	ns	ns	ns
time spent with the NAS	ns			
type of emergency vehicle	ns			
work schedule	ns			
Health/risk behaviour				
alcohol consumption	ns			
doing active, deliberate exercise	ns			
coffee consumption	ns			
energy consumption	ns			
smoking habits	ns			

Note. x: significant difference/association; ns: non-significant difference/association.

5. Discussion

During our study, we attempted to determine – based on the internationally used Folkman and Lazarus Questionnaire (WOC-22) – the sort of coping strategies that are characteristic among professionals carrying out on-site emergency healthcare work. We also sought to find out relationships between the discovered coping strategies and socio-demographic, workplace, and health-influencing factors. No survey on the topics and to this extent had been carried out among paramedics in Hungary before. In Poland Kosydar-Bochenek and colleagues (2017) conducted such a study. In Hungary, Schiszler and colleagues (2016) investigated coping among paramedics, but from a different aspect. We identified four different coping strategies in our sample: problem-oriented, tension-reduction, cognitive restructuring, and risk-seeking. These show many similarities to the WOC 16 questionnaire scale structure used in the high-element-number Hungarostudy 2002 with a civilian sample (Kopp & Kovács 2006).

During our study, we ascertained that tension reduction is more common among women. Different studies have yielded contradicting results in this matter, according to a Hungarian study conducted by Marton-Simora and colleagues

(2008), there is no gender difference when coping with stress; however, a British study by Benett and colleagues (2004) indicates that workplace stress affects male paramedics more significantly than female paramedics, thus there is a difference between coping strategies. Furthermore, a connection can be determined between college education, unmarried persons, and paramedic officers, which indicates that tension reduction is more common among paramedics at the beginning of their careers. At the same time, we did not find any relationships between coping strategies and factors related to health/risk behaviour among on-site paramedics. Emergency workers who dominantly use cognitive restructuring are religious. Among others, the results of the study conducted by Pavenkov and colleagues (2016) show that certain coping strategies are in correlation with the levels of religious faith because the more the person is likely to apply tension reduction, the stronger their religious conviction is. In connection with problem-oriented coping, we see a relationship with a higher level of education, being satisfied with one's financial status, and being inexperienced (having spent the least amount of time or years at their workplace). We see concrete influencing factors characteristic of certain coping subscales come to the forefront; this provides us with the possibility to carry out predisposing surveys in the future to screen for those who use negative coping methods so that we can provide help to prevent negative consequences. We would like to emphasize here that the results of the present study are based on a cross-sectional design, which does not mean causal relationships between examined factors and coping strategies – thus the conclusions should be handled with caution. In the interest of deeper observations to provide confirmation of our observations, we expect further examinations on the topic in the future.

6. Conclusion

Although paramedics are basically characterized by problem-oriented coping strategies, they quite often apply non-adaptive strategies as well; consequently, the chance of developing anxiety is higher among them. Our aim is to use effective intervention methods for curbing the development of anxiety conditions among the ambulance personnel that have long-lasting negative effects on health care. To achieve this goal, we recommend including a questionnaire about coping strategies into the admission process of would-be paramedics; also, completing such questionnaires among the whole emergency workforce.

References

Bennett, P., Y. Williams, N. Page, K. Hood & M. Wollard (2004) 'Levels of Mental Health Problems Among UK Emergency Ambulance Workers', *Emergency Medicine Journal* 21(2), 235–36 (https://doi.org/10.1136/emj.2003.005645).

Betlehem, J., A. Horváth, Zs. Göndöcs, S. Jeges, I. Boncz & A. Oláh (2010) 'Major Contributing Factors of Self Perceived Health in Hungarian Ambulance Personnel', *Orvosi Hetilap,* 151(51), 2089–98 (https://doi.org/10.1556/oh.2010.28976).

Budavári-Takács, I. (2011) A konflikutiskezelés technikái [Conflict management techniques] (Budapest: Szent István Egyetem) note 8.

Budavári-Takács, I. (2011) *A konflikutiskezelés technikái* [Conflict management techniques] (Budapest: Szent István Egyetem) note 9.

Csupor, É., Á. Kuna, J.N. Pintér, Zs. Kaló & M. Csabai (2017) 'Konfliktustípusok és konfliktuskezelés magyar egészségügyi dolgozók körében' [Conflict types and conflict management among Hungarian healthcare workers], *Orvosi Hetilap* 158(16), 625–33 (https://doi.org/10.1556/650.2017.30736).

Deutsch, M. (1973) *The Resolution of Conflict, Constructive and Destructive Processes* (New Haven: Yale UP) (https://doi.org/10.1177/000276427301700206).

Folkman, S. & R.S. Lazarus (1980) 'An Analysis of Coping in A Middle-Aged Community Sample', *Journal of Health and Social Behavior* 21(3), 219—39 (http://doi.org/10.2307/2136617).

Folkman, S. & R.S. Lazarus (1985) 'If it Changes it Must Be Process: Study of Emotion and Coping During Three Phases of a College Examination', *Journal of Personality and Social Psychology* 48(1), 150—70 (https://doi.org/10.1037//0022-3514.48.1.150).

Hegedűs K., N. Szabó, G. Szabó & M. Kopp (2008) 'Egészségesebbek-e az egészségügyben dolgozók? Összehasonlító vizsgálat (2002-2006)' [Are healthcare workers healthier? Comparative study (2002-2006)] *Nővér* 21(1), 3–9.

Kosydar-Bochenek, J., D. Ozga, K. Wozniak, M. Migut, B. Lewandowski & D. Burdzy (2017) 'Traumatic Stress in the Work of Paramedics', *Przegląd epidemiologiczny* 71(4), 639–45.

Kopp, M. & Á. Skrabski (1995) *Magyar lelkiállapot* (Budapest: Végeken).

Kopp M., M.E. Kovács (2006), eds, *A magyar népesség* életminősége *az ezredfordulón* (Budapest: Semmelweis).

Leever, A.M., M.V.D. Hulst, A.J. Berendsen, P.M. Boendemaker, J.L.N. Roodenburg & J. Pols (2010) 'Conflicts and Conflict Management in the Collaboration Between Nurses and Physicians – A Qualitative Study', *Journal of Interprofessional care* 24(6), 612–24 (https://doi.org/10.3109/13561820903550762).

Marton-Simora J., O. Gyermán, G. Nagy, K. Deutsch, Z. Göndöcs & J. Betlehem et al. (2008) 'Poszttraumás stressz a budapesti mentődolgozók körében' [Post-traumatic stress among ambulance workers in Budapest], *Nővér* 21(4), 10–19.

Pavenkov, O., I. Shmelev & M. Rubtcova (2016) 'Coping Behavior of Orthodox Religious Students in Russia', *Journal for the Study of Religions and Ideologies* 15(44), 205–24.

Pék, E., G. Nagy, J. Marton-Simora, K. Deutsch, B. Radnai, J. Szabó & J. Betlehem (2011) 'Élvezeti szerek és Poszttraumás stressz szindróma összefüggései mentődolgozók körében' [Rescue workers among drug use and post-traumatic stress syndrome in context], *Nővér* 24(4), 11–20.

Rahim, M. & T.V. Bonoma (1979) 'Managing Organizational Conflict: A Model for Diagnosis and Intervention', *Psychological Reports* 44(3), 1323–44 (https://doi.org/10.2466/pr0.1979.44.3c.1323).

Rózsa, S., Gy. Purebl, E. Susánszky, N. Kő, E. Szádóczky, J. Réthelyi, I. Danis, Á. Skrabski & M. Kopp (2008) 'Dimensions of Coping: Domestic Adaptation of the Conflict Resolution Questionnaire', *Mentálhigiéné* és *Pszichoszomatika* 9(3), 217—41(https://doi.org/10.1556/mental.9.2008.3.3).

Schiszler, B., A. Karamánné Pakai, Z. Szabó, L.B. Raposa, R. Pónusz, B. Radnai & D. Endrei (2016) 'Munkahelyi stressz és megküzdési stratégiák vizsgálata földi és légi mentésben dolgozók körében' [Investigation of workplace stress and coping strategies among ground and air rescue workers], *Orvosi Hetilap* 157(45), 1802–08 (https://doi.org/10.1556/650.2016.30581).

Szabó, N., K. Hegedűs, G. Szabó, M. Kopp (2008) 'Egészségügyi dolgozók munkahelyi stressz-állapota és társas támogatottsága' [Work-related stress status and social support for health care workers] *Nővér*, 21(1), 10–17.

Szobota L. & Z. Balogh (2019) 'Az egészségkárosító kockázatok ismerete az egészségügyi szakdolgozók körében' [Knowledge of health hazards among health professionals] *Lege Artis Medicinae* 29(12), 615–22, retrieved 14 Oct 2021 from LAM_2019_12.pdf (mtak.hu).

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THE PREDICTIVE ABILITY OF TYPE D PERSONALITY PATTERN, ANXIETY, AND DEPRESSION IN CARDIAC DISEASE**

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A growing body of empirical evidence suggests psychological and personality risk factors for cardiovascular disease in Western developed countries. This study expands that line of health research to a community sample of 309 Jordanians (half of whom were diagnosed with heart problems). Using the Distress Scale, Beck Depression Inventory-II, and State-Trait Anxiety Inventory, this study determined that Type D personality, depression, and anxiety have value in predicting cardiovascular disease. The results showed that older individuals with high levels of social inhibition are more likely to have heart disease compared to younger participants. Anxiety and depression were also potent risk factors. The emerging pattern confirms the cross-cultural validity of Type D personality as well as depression and anxiety indices in predisposing individuals to cardiovascular disease. This study calls for using a multiple-level-analysis approach combining personality and social influences. Patients and health providers can engineer health through psychological wellness and health-promotive behavior. Programs based on self-empowerment theory that target the roots of anxiety and depression, as well as the social inhibition and negative affectivity dimensions of Type D personality (e.g., rage, hostility), should be an integral component of any therapy or intervention.

Keywords: Type D personality; cardiovascular disease; depression; anxiety

1. Introduction

Type D (distressed) personality has been examined as a risk factor for both increased morbidity and mortality in various chronic illnesses. First introduced by Denollet

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and colleagues (1995), Type D has since been identified by its implications in studies of patients with coronary heart disease (CHD), or coronary artery disease. The significance of Type D personality in patients with CHD is the basis of this present study. We sought to determine whether Type D personality, depression, and anxiety have a value in predicting cardiovascular disease.

The Type D personality construct is defined by elevated levels of negative affectivity and social inhibition. Negative affectivity is the tendency to experience negative emotions and is associated with a susceptibility to depression and anxiety. Social inhibition is the tendency to inhibit emotional expression. It is typified by increased feelings of interpersonal insecurity and stress, as well as rigid control of self-expression to avoid perceptions of disapproval by others. Negative affectivity correlates positively with neuroticism on the five-factor model of personality, social inhibition correlates negatively with extraversion, and both negative affectivity and social inhibition correlate negatively with conscientiousness. Assessment of this particular personality construct is often made through the personality Distress Scale (DS14; Denollet 2005). To be classified as Type D, an individual must exceed the standardized cut-off score ≥ 10 in both negative affectivity and social inhibition subscales.

Individuals with Type D personality are prone to elevated levels of psychological distress, characterized by a propensity towards worry, unhappiness, insecurity, pessimism, feelings of tension around others, unwillingness to interact in social settings, and self-blame. Type D patterns also may correlate to low self-esteem, depression, difficulties perceiving and utilizing social support, exhaustion, and minimal satisfaction with quality of life. Major depression and anxiety disorders have been determined to be effective risk factors for CHD (De Hert et al. 2018). In comparison to nondepressed individuals, individuals diagnosed with depression are at higher risk of developing clinical coronary disorders, and major studies linked depression with all-cause mortality (Angermann et al. 2011; De Hert et al. 2018; Moraska et al. 2013).

The prevalence of Type D personality is 21% in the general population, yet 28–53% among cardiac patients (Denollet 2005). Generally, biological and behavioral risk mechanisms are linked to Type D personality which predispose individuals to chronic illness, increased levels of maladaptive health behaviors, lower levels of social functioning, and adaptation of poor coping strategies activation (Denollet et al. 2008). The disuse of social support as a means of reducing psychological distress should be taken into particular regard. Type D individuals fail to perceive the social support available to them (Ginting et al. 2016). Inadherence to medication regimens and other treatment was also notably higher in Type D patients (Williams et al. 2011; Wu et al. 2015). Type D has been consistently linked to unhealthy eating behaviors (Booth & Williams 2015; Nefs et al. 2015) and lack of motivation to exercise (Bunevicius et al. 2014; Wiencierz & Williams 2017). Thus, Type D personality traits may lead to adverse health outcomes in various chronic illnesses.

Findings from past studies have established the relationship between psychological factors and adverse prognosis in patients suffering from heart disease (Denollet 2005). Thus, recognizing the function of Type D personality risk is important not only for implementing strong proactive and reactive intervention programs but also in understanding the etiology of cardiovascular disease. Risk studies in general are grounded in epidemiology and serve as the foundation of health-promotive behavior, with emphasis on the perception of disease patterns across populations and variables that steer the course and development of these patterns (Lilienfeld & Lilienfeld 1980). The individual may alter the course of disease. Risk may be actively reduced or inverted into assets through proactive preventive healthcare offered to susceptible populations (primary and secondary care), as well as through responsive programs for those already diagnosed with cardiovascular conditions (tertiary care).

2. Methodology

We present a comprehensive take on the evaluation of potential psychological and personality mechanisms linking Type D, depression, and anxiety to cardiac disease, emphasizing the heterogeneity of plausible pathophysiological pathways. Data from 309 subjects in Jordan were collected to answer the following research questions:

1. What is the predictive ability of a model to identify patients with heart disease compared to a comparative group without heart disease, based on three factors: Type D personality, depression, and anxiety?

2. Does Type D personality mediate the relationship between cardiac disease and the outcome variables as measured by depression and anxiety?

2.1. Sample

This study included 309 subjects, 54% (n = 166) males. The age range was 19–82 with a mean of 45 years (SD = 12.07). Of the subjects, 156 were diagnosed with a cardiovascular disease marker (blood vessel diseases, coronary artery disease, arrhythmias, angina, or stroke) a year or more prior to the study. Other heart conditions, including congenital heart defects, were excluded. Patients were included in the study if they have been diagnosed for at least one year, in order to be considered stable, with any of the CHD markers (blood vessel diseases, coronary artery disease, arrhythmias or angina). Other heart conditions affecting the heart muscle, valves, or rhythm, including congenital heart defects, were excluded.

The comparative group (n = 153) had no history of cardiovascular disease, hypertension, high cholesterol, or other life-threatening diseases (e.g., cancer, autoimmune diseases) and excluded people who could not read and write. The non-patient group was recruited from the same hospitals, were hospital employees, or had different

vocations in Amman. The groups had similar demographic characteristics (patient and nonpatient group with 54% and 53% males, respectively and mean age, M = 42 and 48 years old, respectively). Both groups were recruited over the same three months. Participation was anonymous and voluntary, with no financial compensation offered. Participants signed a written informed consent form.

2.2. Instruments

2.2.1. Demographic questionnaire

All participants completed the demographic questionnaire (age and gender) and provided lifestyle information such as smoking, and their type of heart condition: blood vessel diseases, coronary artery disease, arrhythmias, angina, or stroke.

2.2.2. The DS14

The DS14 is a 14-item questionnaire with two seven-item subscales (Denollet 2005), which measures the tendency of negative emotions (negative affectivity) and inhibited self-expression in social interactions (social inhibition). Participants respond on a 5-point Likert scale from 0–4 to a range of statements such as 'I am often in a bad mood' (negative affectivity) and 'I find it hard to start a conversation' (social inhibition). The total scores range from 0–28 for each subscale. According to Denollet (2005), a score of 10 or more on both scales is used to classify respondents as having a Type D personality. Denollet (2005) derived the cut-off value from the median split in representative samples on negative affectivity and social inhibition scores of participants in his study; moreover, clinical evidence for this cut-off value-based classification was obtained in longitudinal clinical studies, and empirical evidence was obtained from a latent class cluster analysis (Emons et al. 2007). Test–retest reliability of r = 0.72 for the negative affectivity and 0.82 for the social inhibition subscales was reported as well as a Cronbach's alpha of 0.88 for the negative affectivity and 0.86 for the social inhibition subscales (Denollet 2005).

The DS14 has been validated in countries around the world (Lim et al. 2011; Razzini et al. 2008; Svansdottir et al. 2012). The negative affectivity subscale had a high positive correlation with neuroticism (r = 0.80) and rehearsal (r = 0.58), whereas social inhibition was negatively correlated with extraversion (r = -0.65) and positively correlated with emotional inhibition (r = 0.50), which further supports the divergent validity of the Type D factors and their individual attributes (Svansdottir et al. 2012). Negative affectivity scores had a high correlation with anxiety, depression, and stress scores, indicating that these clearly measure an increased negative effect.

Principal axis factor analysis revealed internally consistent negative affectivity and social inhibition factors, and a confirmatory factor analysis confirmed the two-factor structure of the original scale (Denollet 2005) in a large sample of Icelandic cardiac patients (Svansdottir et al. 2012).

The internal consistency was also measured in the Jordanian study sample. Cronbach's alpha was 0.81 for negative affectivity and 0.85 for the social inhibition subscale. Pearson's correlation was 0.82 for negative affectivity and 0.84 for social inhibition. An English form of the DS14 was translated into Arabic by two bilingual psychologists who independently translated the Arabic form of DS14 items from Arabic into English to ensure the accuracy of the translation. The two independent translations were examined, and one version was constructed. Two psychologists were asked to review the translated version to ensure the accuracy of the wording. Internal consistency estimates in this sample were lower than Denollet's (2005). Cronbach's alpha was 0.75 for Negative Affectivity and 0.51 for Social Inhibition.

2.2.3. State-Trait Anxiety Inventory (STAI)

The STAI was developed by Spielberger, Gorsuch, and Lushene (1970). Forty self-report items measure two types of anxiety: state anxiety, or anxiety about an event, and trait anxiety, or anxiety level as a personal characteristic. Each scale has 20 items rated on a 4-point Likert scale of 0–4. The score on each subscale ranges from 20–80. Higher scores indicate higher levels of anxiety.

The reliability and validity of the STAI were assessed in previous studies by Spielberger and colleagues (1970), and test-retest correlations were calculated to be 0.54 for the State section and 0.86 for the Trait section. Trait anxiety can be defined as feelings of stress, worry, and discomfort that one experiences daily. This is usually perceived as how people feel across typical situations that everyone experiences daily (Spielberger & Sydeman 1994). The Trait Anxiety subscale evaluates relatively stable aspects of anxiety proneness, including general states of calmness, confidence, and security.

A validated Arabic version (Al-Buhairi 2005) of the State Trait Anxiety Inventory-form Y (STAI-Y) (Spilberger et al. 1970) was adopted. Correlations between STAI-Y scores and several criteria indicated strong concurrent validity, namely, with the Catl Scale for Anxiety (r = 0.62 for males and 0.70 for females) and the Eisenck Scale for Neuroticism (r = 0.50 for males and 0.60 for females). The reliability of the STAI-Y was also confirmed; Pearson's correlation coefficient on a test-retest of the same subjects in varying periods of time amounting to one day after the first application, then a week then a month, ranged between 0.77–0.87). The internal consistency was also measured in the study sample. Cronbach's alpha was 0.72 for the Trait Anxiety subscale, and the Pearson correlation was 0.83.

2.2.4. Beck Depression Inventory–II (BDI-II)

The BDI-II is a 21-item self-report instrument intended to assess the existence and severity of symptoms of depression in psychiatrically diagnosed adults and adolescents (Beck et al. 1996).

It is the most widely used instrument for detecting depression, taking only five minutes to complete. Each item is followed by a 4-point scale of 0–3. Two items have seven options indicating either an increase or decrease of appetite and sleep. A total score of 0–13 is considered minimal range, 14–19 is mild, 20–28 is moderate, and 29–63 is severe (Beck et al. 1996). For the current study, score reliability was 0.86, 95% CI = [0.82, 0.89]. The BDI has been reported to be highly reliable regardless of the population. It has a high coefficient alpha (0.80), its construct validity has been established, and it is able to differentiate depressed from nondepressed patients. For the BDI-II, the coefficient alphas were 0.92 for outpatients and 0.93 for college students; stability coefficient reached 0.93, which was significant at $p < 0.001$. The convergent validity of the BDI-II was assessed by administration of the BDI-1A and the BDI-II to two subsamples of outpatients ($N = 191$). The order of presentation was counterbalanced, and at least one other measure was administered between these two versions of the BDI, yielding a correlation of 0.93 ($p < 0.001$) and means of 18.92 ($SD = 11.32$) and 21.89 ($SD = 12.69$), the mean BDI-II score being 2.96 points higher than the BDI-1A. A calibration study of the two scales was also conducted. Factorial validity has been established by the intercorrelations of the 21 items calculated from the sample responses. The BDI-II has been validated in several Arabic countries (Alansari 2005) and is regarded as being valid and reliable, with a reported Cronbach's Alpha of 0.83 and a test-retest reliability of $r = 0.74$ (Al-Musawi 2001). A validated Jordanian version was used in the study (Al-Da`asin 2004). The concurrent validity of the BDI-II was confirmed in Jordanian samples; the correlation coefficients between the BDI-II and several criteria ranged between 0.71 and 0.89. Moreover, significant differences were found in performance on the BDI between the sample of mentally ill patients and community samples. The internal consistency was also measured in the Jordanian study sample; Cronbach's alpha ($n = 156$) was 0.84, and the Pearson correlation ($n = 30$) was 0.88.

2.3. Procedure

After obtaining permission from the Jordanian Ministry of Health, three main hospitals were selected to collect information from the cardiac clinics in these hospitals. The CHD sample was randomly selected with the help of the nurses from among cardiac patients who have odd queue numbers in the reception room. All procedures performed were in accordance with the ethical standards of the institu-

tional or national research committee in Jordan (Al-Omari & Al-Hussaini 2017) and with the 1964 Helsinki declaration and its later amendments (World Medical Association 2013) or comparable ethical standards. Informed consent was obtained from all individual participants included in the study. The sample of nonpatients was randomly selected from individuals in the hospitals at the same time as the information was collected from the CHD patients. The rest were randomly selected from the employees in the hospital and different vocational sectors in Amman.

All surveys were completed in the presence of the researchers, who stayed with the participants to answer any questions. After the application was completed, all the instruments were reviewed; none were excluded because all were complete and appropriate for the purposes of the study. To ensure anonymity, participants were instructed not to provide any background information that might disclose their identities or their families'. Finally, participants received no compensation for participation in the study.

3. Data analysis

The results of the logistic regression analysis (see *Table 1*) showed four factors as significant predictors of heart problems. These factors were age, Wald($df = 1$) = 14.67, $p < 0.001$; social inhibition, Wald($df = 1$) = 15.21, $p < 0.001$; anxiety, Wald($df = 1$) = 5.38, $p < 0.05$; and depression, Wald($df = 1$) = 8.89, $p < 0.05$. These results showed that older participants with higher levels of social inhibition, anxiety, and depression were more likely to experience heart problems.

Table 1
The results of logistic regression

Factor	*B*	*Wald*	*df*	*P*	*-22L*	R^2	*Odds ratio*
Age	0.04	14.66	1	0.000	410.51	0.056–0.075	1.04
Social Inhibition	-0.12	15.21	1	0.000	393.84	0.106–0.141	0.89
Anxiety	0.04	5.38	1	0.020	379.65	0.146–0.194	1.04
Depression	0.05	8.89	1	0.003	374.10	0.161–0.215	1.05

The results showed that the overall model correctly predicted heart problems among participants, $\chi^2(df = 4) = 54.24$, $p < 0.001$. This model has a good fit, -2 *log* likelihood = 374.10, Hosmer and Lemeshow, $\chi^2(df = 8) = 8.79$, $p > 0.05$.

The results of the Cox-Snell and the Nagelkerke R^2 indicated that age accounted for 5.6–7.5% of the variance in heart problems. Social inhibition accounted for

another 5.0–6.6% of the variance. Anxiety added 4.0–5.3%, and depression added 1.5–2.1% to the variance in having heart problems. Overall, the model accounted for 16.1–21.5% of the variance in having heart problems. Finally, the model correctly classified 69.3% of the 'having no heart problems' cases and 66% of the 'having heart problems' cases. Overall, this model had a success rate of 68%.

A hierarchical regression analysis was conducted to determine the power of sociodemographic variables (Step 1: age and gender), type of heart condition (Step 2: blood vessel diseases, coronary artery disease, arrhythmias, angina, or stroke, and Type D personality), (Step 3: negative affectivity vs social inhibition) in predicting the degree of distress or anxiety experienced by subjects (see *Table 2*). Two factors emerged as significant predictors of anxiety: type of heart condition, $\beta = 0.22$, $p < 0.001$, and Type D personality, $\beta = 0.49$, $p < 0.001$. In this analysis, type of heart condition accounted for about 4% of the variance; Type D personality accounted for 24% of the variance. In this model, the combination of both significant factors accounted for 28% of the variance.

Table 2
Type of heart condition and Type D personality as predictors of depression and anxiety: hierarchical regression analysis

Factor	*R*	R^2	β	*F*	*p*
Anxiety					
Type of Heart Condition	0.20	0.04	0.22	12.52	< 0.001
Type D Personality	0.53	0.28	0.49	59.41	< 0.001
Depression					
Type of Heart Condition	0.24	0.06	0.26	18.00	< 0.001
Type D Personality	0.48	0.24	0.42	46.42	< 0.001

Similar trends were detected with distress of depression, $F(2.306) = 46.42$, $p < 0.001$; type of heart condition, $\beta = 0.26$, $p < 0.001$; and Type D personality, $\beta = 0.42$, $p < 0.001$. Type of heart condition accounted for about 6% of the variance, whereas Type D personality accounted for 18% of the variance, and the joint contribution of both factors accounted for 24%.

However, when an analysis was conducted using dimensions of Type D personality (social inhibition and negative affectivity), only negative affectivity was detected as a significant predictor of anxiety, accounting for 32% of the variance; social inhibition emerged as a nonsignificant factor, $\beta = 0.05$, $p > 0.05$. For depression,

type of heart condition again accounted for 6% of the variance. However, of the total effect of Type D personality (18%), 1% percent was attributed to the social inhibition factor, and the vast majority of the variance (17.85%) was assigned to negative affectivity.

4. Discussion

Cardiovascular health has drawn increasing attention in Jordan. Our research has uncovered that social inhibition, anxiety, and depression are risk factors for the development of cardiovascular disorders, confirming the previous research of European and American samples. Further, the results negate the dichotomy between psychological and personality dimensions of well-being.

Specifically, age accounted for 5.6–7.5% of the variance in heart problems, social inhibition accounted for another 5.0–6.6%, and anxiety accounted for 4.0–5.3%. Overall, the model accounted for 16.1–21.5% of the variance in cardiac disorders. The model correctly classified 69.3% of the healthy sample and 66% percent of the target group sample. Accordingly, this model had a success rate of 68%. Older participants with higher levels of social inhibition, anxiety, and depression were more likely to experience cardiovascular disease. The results highlighted the role of social inhibition in the progression and prognosis of cardiovascular disease.

The results, however, did not indicate the direction and the causal inferences. More advanced statistical analyses are needed to determine the antecedent. Bidirectionality among Type D personality, depression, anxiety, and cardiac conditions also may occur. Hierarchical regression analysis may provide a plausible explanation to the bidirectionality among the variables. The analysis of hierarchical regression demonstrated that the type of vascular condition and Type D personality (particularly negative affectivity) were significant predictors of distress from depression. In particular, the type of vascular condition accounted for approximately 4% of the variance in anxiety indices and 24% for Type D personality. Similar patterns were detected with depression. Thus, one strategy of health-promotive behavior programs should be to target the main effect associated with these risk factors. Programs targeting cardiovascular patients should introduce additional assets that function as protective factors, to compete or counterbalance the negative effects of risk factors, thereby allowing the patient to maintain normative heart condition functioning. Health promotive programs may be designed as either proactive or reactive programs.

Furthermore, it is difficult to determine whether the level of depression and anxiety associated with cardiovascular disease is independent of Type D personality. Depression and anxiety may be partially assigned to the negative affectivity dimension of Type D personality. The link between depression and anxiety has been well

established in heart disease patients (Kupper & Denollet 2016; Molina-Leyva et al. 2015). Through mechanisms of physiological hyperreactivity, immune activation, and poor health behaviors, Type D personality can adversely shape health conditions and catalyze the development of heart disease (Gilmour & Williams 2012). This personality trait can impede satisfaction with quality of life (Sogaro et al. 2015), directly affecting self-esteem (Huis et al. 2011).

Patients with Type D personality are likely to experience higher levels of perceived stress as they use more passive and maladaptive avoidance coping styles (Polman et al. 2010). Consequently, this population fails to utilize social support – an essential method known as evidence-based techniques in minimizing psychological stress (Ginting et al. 2016). These findings call for interventions targeting internal and external resources, such as improving patients' lifestyle choices. Other internal health-promotive resources to consider for treatment involve improving patients' self-esteem, self-efficacy, and self-regulations. These efforts are potent interventions to help deter or neutralize the adverse effects of risk factors linked to depression and anxiety.

Finally, given the collective nature of Jordanian society and the stigma associated with seeking mental health therapies, intervention efforts must include community-based empowerment strategies. Greater awareness of cardiovascular disease risk factors is needed for individuals to recognize their personal risk, adapt health-promotive preventative behaviors, and seek necessary therapies.

5. Summary

According to the World Health Organization (2017), 31% of global deaths are attributed to cardiovascular disease, cementing it as the main cause of death in the human population. In the past, the study of cardiac and vascular diseases remained embedded in the medical paradigm. However, studies suggesting the vital function of behavior in the etiology of such diseases have increased exponentially, predicting the joint determination of behavioral and biological processes in the pathogenesis of cardiovascular diseases (Rosengren et al. 2004). Behavioral cardiology has expanded as a field within cardiovascular medicine, with a broad repertoire of literature available on the epidemiological and pathophysiological implications of psychosocial risk factors in the etiology of cardiac diseases.

The current study is nested in the risk framework, giving prominence to personality risk factors predisposing or placing individuals at higher risk status for CHD. The study's findings confirm the essential nature of the psychological and personality risk/protective factor framework. The results also identify processes that mediate between risk factors and cardiovascular disease.

To counteract the risk factors associated with depression, anxiety, and the traits of Type D personality, practitioners could cultivate the patient's health-promotive self-efficacy, self-control, self-regulation, and other critical coping strategies to neutralize the damaging effects of these risk factors. Of course, some individuals may have the potential to alter disease etiology by balancing risk and protective processes.

This study has inherent limitations as a cross-sectional study, and longitudinal research designs are preferred in capturing the continuity and discontinuity of the adverse effects of risk factors in the progression and prognosis of cardiovascular disease. More sophisticated analysis is needed to understand not only personality and social risk factors, but also the processes involved in the course of cardiovascular disease. The supplementary role of protective factors, as well as the reciprocation between risk and protective factors, are two domains that should guide health-promotive intervention programs to moderate the adverse trajectories of risk factors. In addition, essential intervention should incorporate both individual therapeutic modalities and culturally responsive community outreach programs to empower patients at risk of heart disease.

References

Alansari, B.M. (2005) 'Beck Depression Inventory (BDI-II) Items Characteristics among Undergraduate Students of Nineteen Islamic Countries', *Social Behavior and Personality: An international journal* 33(7), 675–84 (https://doi.org/10.2224/sbp.2005.33.7.675).

Al-Da`asin, K. (2004*) Psychometric Characteristics of Beck II List of Depression (BDI-II) in the Jordanian Environment* (MA thesis, Mutah University, Karak, Jordan).

Al-Musawi, N.M. (2001) 'Psychometric Properties of the Beck Depression Inventory-II with University Students in Bahrain', *Journal of Personality Assessment* 77(3), 568–79 (https://doi.org/10.1207/S15327752JPA7703_13).

Al-Omari, A. & M. Al-Hussaini (2017) 'Research Ethics Governance in the Arab Region: Jordan' in H. Silverman eds., *Research Ethics in the Arab Region. Research Ethics Forum*, *Volume 5* (Cham: Springer) (https://doi.org/10.1007/978-3-319-65266-5_21).

Angermann, C.E., G. Gelbrich, S. Störk, M. Schowalter, J. Deckert, G. Ertl & H. Faller (2011) 'Somatic Correlates of Comorbid Major Depression in Patients with Systolic Heart Failure', *International Journal of Cardiology* 147(1), 66–73 (https://doi.org/10.1016/j.ijcard.2009.07.044).

Beck, A.T., R.A. Steer & G.K. Brown (1996) *Beck Depression Inventory-II (BDI-II)* (San Antonio, TX: Psychological Corporation).

Booth, L. & L. Williams (2015) 'Type D Personality and Dietary Intake: The Mediating Effects of Coping Style', *Journal of Health Psychology* 20(6), 921–27 (https://doi.org/10.1177/1359105315573433).

Bunevicius, A., J. Brozaitiene, M. Staniute, V. Gelziniene, I. Duoneliene, V.J.M. Pop, R. Bunevicius & J. Denollet (2014) 'Decreased Physical Effort, Fatigue, and Mental Distress in Patients with Coronary Artery Disease: Importance of Personality-Related Differences', *International Journal of Behavioral Medicine* 21, 240–47 (https://doi.org/10.1007/s12529-013-9299-9).

De Hert, M., J. Detraux & D. Vancampfort (2018) 'The Intriguing Relationship Between Coronary Heart Disease and Mental Disorders', *Dialogues in Clinical Neuroscience* 20(1), 31–40.

Denollet, J. (2005) 'DS14: Standard Assessment of Negative Affectivity, Social Inhibition, and Type D Personality', *Psychosomatic Medicine* 67(1), 89–97 (https://doi.org/10.1097/01.psy.0000149256.81953.49).

Denollet, J., S.U. Sys & D.L. Brutsaert (1995) 'Personality and Mortality After Myocardial-Infarction', *Psychosomatic Medicine* 57(6), 582–91 (https://doi.org/10.1097/00006842-199511000-00011).

Denollet, J., C.J. Vrints & V.M. Conraads (2008) 'Comparing Type D personality and Older Age as Correlates of Tumor Necrosis Factor-a Dysregulation in Chronic Heart Failure', *Brain, Behavior, and Immunity* 22(5), 736–43 (http://doi.org/10.1016/j.bbi.2007.10.015).

Emons, W.H.M., R.R. Meijer & J. Denollet (2007) 'Negative Affectivity and Social Inhibition in Cardiovascular Disease: Evaluating Type-D Personality and its Assessment Using Item Response Theory', *Journal of Psychosomatic Research* 63(1*)*, 27–39 (https://doi.org/10.1016/j.jpsychores.2007.03.010).

Gilmour, J. & L. Williams (2012) 'Type D Personality Is Associated with Maladaptive Health-Related Behaviours', *Journal of Health Psychology* 17(4), 471–78 (https://doi.org/10.1177/1359105311423117).

Ginting, H., M. van de Ven, E.S. Becker & G. Näring (2016) 'Type D Personality Is Associated with Health Behaviors and Perceived Social Support in Individuals with Coronary Heart Disease', *Journal of Health Psychology* 21(5), 727–37 (https://doi.org/10.1177/1359105314536750).

Huis in't Veld, E.M.J., A.J.J.M Vingerhoets & J. Denollet (2012) 'Attachment Style and Self-Esteem: The Mediating Role of Type D Personality', *Personality and Individual Differences* 50(7), 1099–1103 (https://doi.org/10.1016/j.paid.2011.01.034).

International Committee of Medical Journal Editors (2018) *Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals,* retrieved 25 Aug 2021 from http://www.icmje.org/recommendations/.

Kupper, N. & J. Denollet (2018) 'Type D Personality as a Risk Factor in Coronary Heart Disease: A Review of Current Evidence', *Current Cardiology Reports* 20, 104 (https://doi.org/10.1007/s11886-018-1048-x).

Lilienfeld, A.M. & D.E. Lilienfeld (1980) *Foundations of Epidemiology* (New York: Oxford UP).

Lim, H.E., M.-S. Lee, Y.-H. Ko, Y.-M. Park, S.-H. Joe, Y.-K. Kim, C. Han, H.-Y. Lee, S.S. Pedersen & J. Denollet (2011) 'Assessment of the Type D Personality Construct in the Korean Population: A Validation Study of the Korean DS14', *Journal of Korean Medical Science* 26(1), 116–23 (https://doi.org/10.3346/jkms.2011.26.1.116).

Molina-Leyva, A., I. Caparros-delMoral, J.C. Ruiz-Carrascosa, R. Naranjo-Sintes & J.J. Jimenez-Moleon (2015) 'Elevated Prevalence of Type D (Distressed) Personality in Moderate to Severe Psoriasis Is Associated with Mood Status and Quality of Life Impairment: A Comparative Pilot Study', *Journal of the European Academy of Dermatology and Venereology* 29(9), 1710–17 (https://doi.org/10.1111/jdv.12960).

Moraska, A.R., A.M. Chamberlain, N.D. Shah, K.S. Vickers, T.A. Rummans, S.M. Dunlay, J.A. Spertus, S.A.Weston, S.M. McNallan, M.M. Redfield & V.L. Roger (2013) 'Depression, Healthcare Utilization, and Death in Heart Failure', *Circulation: Heart Failure* 6(3), 387–94 (http://doi.org/10.1161/circheartfailure.112.000118).

Nefs, G., J. Speight, F. Pouwer, V. Pop, M. Bot & J. Denollet (2015) 'Type D Personality, Suboptimal Health Behaviors and Emotional Distress in Adults with Diabetes: Results from Diabetes MILES–The Netherlands', *Diabetes Research and Clinical Practice* 108(1), 94–105 (https://doi.org/10.1016/j.diabres.2015.01.015).

Oliva, F., E. Versino, L. Gammino, N. Colombi, L. Ostacoli, S. Carletto, P.M. Furlan & R.L. Picci (2016) 'Type D Personality and Essential Hypertension in Primary Care: A Cross-Sectional Observational Study Within a Cohort of Patients Visiting General Practitioners', *Journal of Nervous and Mental Disease* 204(1), 43–48 (https://doi.org/10.1097/NMD.0000000000000421).

Polman, R., E. Borkoles & A.R. Nicholls (2010) 'Type D Personality, Stress, and Symptoms of Burnout: The Influence of Avoidance Coping and Social Support', *British Journal of Health Psychology* 15(3), 681–96 (https://doi.org/10.1348/135910709X479069).

Razzini, C., F. Bianchi, R. Leo, E. Fortuna, A. Siracusano & F. Romeo (2008) 'Correlations Between Personality Factors and Coronary Artery Disease: From Type A Behaviour Pattern to Type D Personality', *Journal of Cardiovascular Medicine* 9(8), 761–68 (https://doi.org/10.2459/JCM.0b013e3282f39494).

Rosengren, A., S. Hawken, S. Ôunpuu, K. Sliwa, M. Zubaid, W.A. Almahmeed, K.N. Blackett, C. Sitthi-amorn, H. Sato & S. Yusuf (2004) 'Association of Psychosocial Risk Factors with Risk of Acute Myocardial Infarction in 11,119

Cases and 13,648 Controls From 52 Countries (The INTERHEART Study): Case-Control Study', *The Lancet* 364(9438), 953–62 (https:/doi.org/10.1016/s0140-6736(04)17019-0).

Sogaro, E., F. Schininà, C. Burgisser, F. Orso, R. Pallante, T. Aloi, D. Vanni, A. Pazzagli & F. Fattirolli (2010) 'Type D Personality Impairs Quality of Life, Coping and Short-Term Psychological Outcome in Patients Attending an Outpatient Intensive Program of Cardiac Rehabilitation', *Monaldi Archives for Chest Disease* 74(4), 181–91 (https://doi.org/10.4081/monaldi.2010.259).

Spielberger, C.D. & S.J. Sydeman (1994) 'State-Trait Anxiety Inventory and State-Trait Anger Expression Inventory' in M.E. Maruish ed., *The Use of Psychological Testing for Treatment Planning and Outcome Assessment* (Hillsdale, NJ: Erlbaum) 292–321.

Spielberger, C.D., R.L. Gorsuch & R.E. Lushene (1970) *Manual for the State-Trait Anxiety Inventory* (Palo Alto, CA: Consulting Psychologists Press).

Spielberger, C.D., R.L. Gorsuch & R.E. Lushene (2005) *Manual for the State-Trait Anxiety Inventory*, trans. A.R. Al-Buhairi (Cairo: The Egyptian Renaissance Library).

Svansdottir, E., H.D. Karlsson, T. Gudnason, D.T. Olason, H. Thorgilsson, U. Sigtryggsdottir, E.J. Sijbrands, S.S. Pedersen & J. Denollet (2012) 'Validity of Type D Personality in Iceland: Association with Disease Severity and Risk Markers in Cardiac Patients', *Journal of Behavioral Medicine* 35, 155–66 (https://doi.org/10.1007/s10865-011-9337-5).

Wiencierz, S. & L. Williams (2017) 'Type D Personality and Physical Inactivity: The Mediating Effects of Low Self-Efficacy', *Journal of Health Psychology* 22(8), 1025–34 (https://doi.org/10.1177/1359105315622557).

Williams, L., R.C. O'Connor, N. Grubb & R. O'Carroll (2011) 'Type D Personality Predicts Poor Medication Adherence in Myocardial Infarction Patients', *Psychology & Health* 26(6), 703–12 (https://doi.org/10.1080/08870446.2010.488265).

World Health Organization (2021) *Cardiovascular diseases (CVDs),* retrieved 25 Aug 2021 from http://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds).

World Medical Association (2013) *WMA declaration of Helsinki—Ethical principles for medical research involving human subjects* (Amended by the 64th WMA General Assembly, Fortaleza, Brazil, October 2013), retrieved 25 Aug 2021 from https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/.

Wu, J.R., E.K. Song & D.K. Moser (2015) 'Type D Personality, Self-Efficacy, and Medication Adherence in Patients with Heart Failure—A Mediation Analysis', *Heart & Lung* 44(4), 276–81 (https://doi.org/10.1016/j.hrtlng.2015.03.006).

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THE ROLE OF THE EMPLOYEE IN HUNGARIAN HOSPITAL PERFORMANCE APPRAISAL SYSTEMS**

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In this paper, we examined the employee Performance Appraisal System (PAS) of hospitals and gave a description of the role and significance of employees in the PAS covering 27% of the population of Hungarian state-run hospitals. In the research, we also examined the relationship between performance appraisal and employee engagement, as well as the practice of measuring employee satisfaction. We created a scale called *Employee participation in the employee performance appraisal scale*. Based on our findings, we can state that the employee is an active participant in the Hungarian performance appraisal systems of hospitals, as they are involved in the appraisal and their views are taken into account. It has been found that where employee satisfaction is measured, there is an opportunity for the employees to formulate reflections on their evaluations. Although not outstanding, the employee is considered a partner in the evaluation of his work.

Keywords: performance appraisal systems; employee engagement; employee satisfaction measurement; Hungarian; hospital

1. Introduction

Planning is an integral part of all management activities, thus strategic human resource management requires foresight to better meet organizational and individual needs. This kind of (novel) approach allows the organization to see its employees as strategic partners, using their knowledge as a competitive advantage in a market

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environment (Kariithi & Ogutu 2016). For this reason, we consider employee engagement to be an important factor in a successful organization, including hospitals.

Performance appraisals are regular reviews of employee performance within an organization (Patil & Dalvi 2019). Performance management (PM) 'will help you to create and sustain high levels of employee engagement, which leads to higher levels of performance' (Gruman & Saks 2011, 133). We conducted a large, exploratory, descriptive study of Hungarian employee performance appraisal systems in Hungarian hospitals. In the research, we also examined the practice of measuring employee satisfaction. Accordingly, we also studied how employee satisfaction measurement is related to performance appraisal. The aim of this publication is to present the importance and role of the employee in Hungarian hospital performance appraisal systems: how active the employee is in the evaluation, how much the employee is considered as a partner.

To our knowledge, no such hospital research has so far been conducted in Hungary.

2. Theoretical framework

2.1. Performance appraisal

The harmony of institutional and individual goals is essential in the operation of a successful institution and organization (Bakacsi 2015). Without performance appraisal, it is difficult to measure the achievement of institutional goals and an individual's performance. Work can be evaluated in two ways: formally and informally (Bokor et al. 2009). In the world of work, informal evaluation (such as verbal praise) is part of organizational culture (Takács 2000). Formal evaluation can be an objective element of the employee's career development and the assessment of any employee benefits and rewards, and can also clarify the expectations placed on the employee. On the employer's part, it helps to maintain and increase performance, not only by identifying and improving the factors that hinder and complicate work, but also by motivating and developing employees (Boncz et al. 2011). The performance appraisal system (PAS) can therefore also be seen as an organized 'communication channel' provided to the employer and the employee (Karolinyné & Poór 2010, 290). Information gathered through this channel also helps the organization make efficient use of the limited resources.

2.2. Performance appraisal and employee engagement

It has been known since Herzberg that work achievement, performance, and its recognition act as motivating factors for the employee (Bakacsi 2015). While several definitions of commitment are known, we prefer the definition of Gyökér and Krajcsák (2009, 59): 'Commitment is most often an action form of satisfaction; innovative, creative,

value-creating behavior created as a result of internal motivation in order to achieve the organizational goal.' Employee commitment and satisfaction are closely related, but they are not synonymous (Gyökér & Krajcsák 2009). In our interpretation, employee satisfaction is the foundation from which employee engagement develops. The key moment in this process is an essential element of performance appraisal. Hsieh (2016) also confirmed in his study that job performance and job satisfaction significantly influence each other. Assessment is not only a cognitive process because it also has a sociological and an organizational context (Jenkins 2005). Appraisal is typically influenced by an individualization process. Evaluation – as people's work is considered and judged – must also be well-thought-out psychologically. The 'Achilles heel' of human capital management is PM (Gruman & Saks 2011, 123). Employee engagement is often seen as a key factor in an organization's success and competitiveness. In relation to performance appraisals, the study by Hermel-Stănescu (2015) illustrates well the importance of aligning individual and institutional goals. The author states that a properly constructed and implemented PAS is a critical success factor for companies and organizations in the business world. PM is geared towards the future; in the direction of developments, not simply in an evaluation of the past. It is a continuous and evolutionary process through which performance improves over time. This is what the author calls 'the performance management cycle'. The stages of this cycle are: performance and development planning, performance measurement, goals, and goal integration. An essential part of the process is the acceptance of performance evaluation by employees and its facilitation. Acceptance of appraisal is influenced by, among other things, the quality of the relationship between the evaluator and the evaluated; the opportunity to participate in the evaluation process (agreement on the performance to be achieved); perception of empowered employees, and perception of objectives (Kim 2014). If managerial decisions reward the work done with fair and equitable rewards as well as advancement, it increases employee engagement and loyalty to the organization (Salau et al. 2014). In the same spirit, should employees be sufficiently motivated towards necessary and appropriate training, work-related innovation will increase, thereby helping the organization gain a competitive advantage. In addition, employees agree that receiving regular feedback on their performance in the workplace can make an organization sustainable. This also helps them to identify their strengths and weaknesses (Salau et al. 2014). Hospital research by Bibi and Khan (2019) also supports that PA itself influences employee performance.

The issue of performance appraisal affecting employee motivation is also addressed in Jabeen (2011) in his study. He says inspiration can come not only from the outside (in the form of increased pay) but also from internal factors. Internal factors include gratitude, fulfillment, and accomplishment. Misiak (2010) acknowledges that performance appraisal is one of the most important tools for human resource management, but a poorly constructed and implemented PAS can be more harmful than useful. Ethical appraisal is fair and objective. Implementing this ethical assessment is

an extremely difficult task, but it is possible. Nure (2018) finds that the continuous and fair appraisal of employees is related to their motivation and further job performance.

The design and operation of a well-functioning PAS is a basic requirement. Determining aspects must be taken into account during design. These are: it is necessary to first define the performance itself; decide whether the evaluation should be based on a performance management goal; identify the different performance evaluation techniques to be used in the evaluation and select the participants in the evaluation. There may be many participants in the appraisal, but the primary actor is the evaluated boss, immediate superior, and workplace leader. Based on his/her task, he/she has the best opportunity to see the evaluated work, but he/she is also aware of the obligations assigned to the employee and the requirements placed on him/her (Bokor et al. 2009; Karolinyné & Poór 2010; Boncz et al. 2011). Because the employee's active participation remains essential in a well-functioning PAS; employee engagement is the foundation not only of the way one works, but also of the evaluation of the work one does. For this reason, employee appraisal and self-appraisal should be an integral part of the evaluation process. One of the arguments in favor of self-appraisal is that the employee is closely aware of his/her motivation and has sufficient information about his/her own work (Bokor et al. 2009).

In their own empirical study of hospital workers, Sing and Vadivelu (2019) found that 85% of workers think PA is useful. It is also important that employees receive appropriate training or counselling after the assessment.

2.3. Hypotheses

Based on the theoretical background and literature review, we formulated three hypotheses:

- H1: The majority of hospitals measure employee satisfaction.
- H2: During the performance appraisal in hospitals, the employees have the opportunity to formulate reflections.
- H3: Where there is an employee satisfaction measurement, the employee also has the opportunity to formulate reflections.

Our further research questions are presented in the Methodology section.

3. Research background

The present research has two antecedents. The first author, as an acting manager, performed a performance appraisal at the Central Physiotherapy Department of the Nagykőrös Rehabilitation Specialist Hospital. The performance evaluation was carried out on the instructions of the Directors-General. The results of the performance evaluation were presented (Sárga 2016). This was followed by an

exploratory study in the hospitals located in the Hungarian Dél-Alföld Region. The focus of the research was to learn about and present different performance appraisal practices. The results of this research have also been published (Sárga 2017). The valuable experience gained during the research has been incorporated into the current study.

4. Methodology

We examined Hungarian, state-run hospitals, assuming that they perform employee performance appraisals and that appraisal can be analyzed. We also examined the extent to which the employee appears in the development and operation of PAS and how integral the employee is to the evaluation process. We were curious about the prevalence of employee satisfaction measurement in Hungarian hospitals. We also examined the relationship between PAS and employee satisfaction measurement. At the time of the study, no mandatory and uniform performance evaluation existed in Hungarian hospitals. It was the management's own decision whether their institution had a performance appraisal and, if so, what features worked in it.

We performed data collection using a questionnaire method. In compiling the questionnaire, we took into account the literature and available professional materials. We also crafted it for the study of the already-mentioned Dél-Alföldi Region. The questionnaire was sent to the directors general of the state-run hospitals on a paper basis. During the study period, we identified 114 hospitals that we wanted to include in the research. The response was voluntary and anonymous. The completed questionnaires were intentionally returned to the research participants and not to the maintainer. The survey was conducted in August and September 2018. Our research questions and aspects can be found in *Table 1.*

Table 1
Research questions

1.	Did the evaluated person participate in the development of the performance appraisal system?
2.	Does the evaluated person participate in the updating and review of the performance appraisal system?
3.	Is there an employee satisfaction measurement in the hospital?
4.	If so, how often?
5.	Does the evaluated person participate in your performance appraisal system?
6.	Does the evaluated employee receive feedback on the performance appraisal?
7.	Does the employee have the opportunity to formulate reflections on his or her appraisal?

For the questions *distribution in the development of the PAS*, *review of the PAS*, *feedback*, and *reflections*, multiple choices were offered; in the question *employee satisfaction measurement,* there were 4 (ordinal scale), in the question *frequency of employee satisfaction measurement*: six options; and a 4-point Likert scale was used to rate question *participants in the appraisal*.

Based on previous managerial and research experience, in order to get a more nuanced picture of employee participation in PAS, we weighted the variables with the exception of question 4, which asks about the frequency of employee satisfaction measurement. The variables and the weights assigned to them are shown in *Table 2*. The focus of our research has been active employee participation, and we believe that performance appraisal can be effective if it is done in cooperation with the employee. For this reason, it is recommended that the employee be actively and meaningfully involved in the development and review of the performance appraisal system and in the appraisal process itself. We consider it essential that the employee receive relevant feedback on the evaluation. In connection with this, another important and forward-looking aspect is that the employee has the opportunity to formulate reflections. We believe that it is crucial that hospitals have employee satisfaction measurements – and, where available, provide meaningful information, and that the information derived from it is used in a management decision.

Table 2
The weighted variables

Name of the variable		*Variable weight*
Did the evaluated participate in the development of the performance appraisal system?	if yes	1
Does the evaluated person participate in the updating and review of the performance appraisal system?	if yes	1
Is there an employee satisfaction measurement in the hospital?		
No.		0
Yes, but the information obtained from it may be used occasionally.		0,1
Yes, and we often base decisions on it.		0,5
We consider it important, measure it, and use the results obtained from it.		1
Does the evaluated person participate in your performance appraisal system?		
Does not participate in the appraisal.		0
Participate, but his/her opinion may be.		0,1

Participate, his/her opinion is decisive.	1
Involved, we consider the most important.	1,5
Does the evaluated employee receive feedback on the performance appraisal?	
Yes, orally.	0,5
Yes, in writing.	0,5
Yes, in both forms.	1
No, in any form.	0
Does the employee have the opportunity to formulate reflections on his or her appraisal?	
No.	0
Possibly.	0,1
Often.	0,5
Yes, and we take them somewhat into account.	1

5. Results

The questionnaire was returned by a total of 31 hospitals. Response rate is 27%. The exact response rates for the different questions are shown separately. Nearly 13% of evaluators are involved in the development of the PAS, but they are no longer involved in its review. The distribution of the other participants is shown in *Table 3*.

Table 3
Distribution of participants in the development and revision of the performance appraisal system (expressed as a percentage of respondents)

	Top manager (s)	*HR department*	*Workplace manager (s)*	***Employees***	*Colleagues*	*External company*	*Others*
Development of	64,52	38,71	32,26	**12,90**	12,90	16,13	6,45
In its review	54,84	38,71	29,03	**0,00**	3,23	12,90	6,45

In connection with the measurement of employee satisfaction, it can be stated that more than a third of the surveyed institutions consider it important, measure it, and use the data obtained from it. There is an equal proportion of employee satisfaction measurements, but the information obtained from it may be used occasionally. It can be stated that few hospitals have no measurement of employee satisfaction at all. The first hypothesis was thus verified. In detail, in *Figure 1.*

Figure 1
Measuring employee satisfaction

Employee satisfaction is measured annually in just over half of the cases (n = 18). In two cases, the measurement is done quarterly and half a year, respectively. In seven cases. it was done less frequently and in two cases, no employee satisfaction was measured. The participants of the evaluation system can be divided into two groups. In one group are those who are actively involved in the evaluation and their opinions are decisive. The other group includes those who are practically not involved in the evaluation as well as less active participants in the evaluation system, whose opinions are aleatory. Regarding the participants in the appraisals, it was found that the opinion of the workplace's evaluated direct supervisor is the most decisive, followed by that of the evaluated employer, and then the evaluated person himself. In detail *Table 4.*

Table 4
Participants in the appraisal

	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
Workplace manager	25	1	4	3,52	0,714
Employer	25	1	4	2,52	1,262
Self-appraisal	25	1	4	2,48	1,295
HR department	25	1	3	1,36	0,569
Colleagues (s) in the identical position	24	1	3	1,42	0,654
Colleagues (s) in the non-identical position	25	1	3	1,28	0,542
Patients treated by the employee	25	1	3	1,52	0,823
Others	9	1	3	1,22	0,667

1: not involved; 4: most important.

Regarding the feedback of the appraisals, it can be said that almost half of the evaluated employees receive feedback, both in writing and orally. Detailed distribution in *Figure 2*.

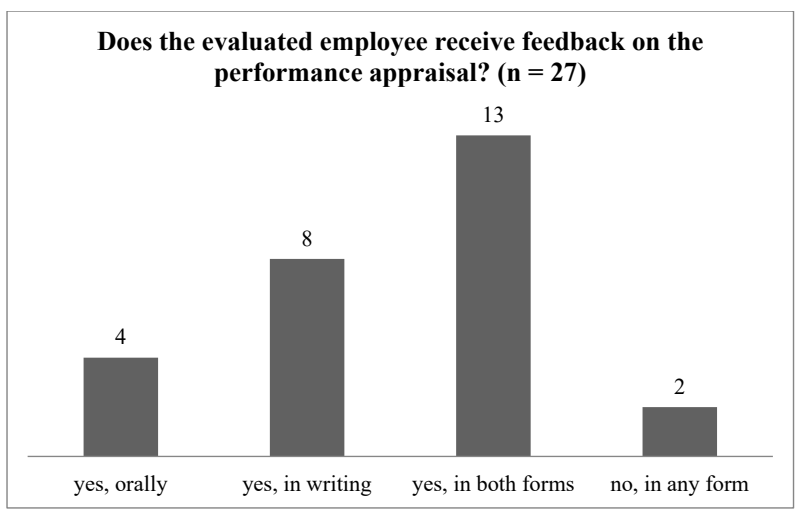

Figure 2
Feedback on the appraisal

We also asked to what extent the employee has an opportunity to formulate reflections on the evaluations. They have a vast majority of options, and they are somewhat taken into account. It can be stated that in a few cases the employee has no – or only possibly – the opportunity to formulate reflections. The second hypothesis was also verified. The total distribution is shown in *Figure 3*.

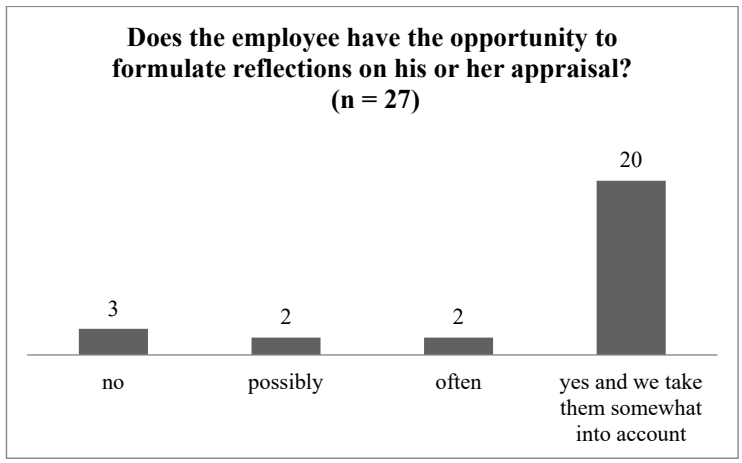

Figure 3
Reflections on appraisal

The weighted variables mentioned above were placed on a scale called *Employee participation in employee performance appraisal*. Analyzing the responding hospitals, it can be stated that the participation of employees in the appraisal of employee performance in Hungarian hospitals could be considered moderate: the average of the variable measured on a 0–1 scale is 0.437, the distribution median is 0.323 (= thus half of the respondents are below and the other half of the sample is above this level). This is also supported by the distribution diagram in *Figure 4*.

Based on the analysis of the obtained results, it was found that where there is an employee satisfaction measurement, an opportunity exists for the evaluated person to formulate reflections (and they are taken into account to some extent). The third hypothesis was also confirmed. This statement can be verified, and it can be clearly seen in *Table 5*; but the statistical analysis (both chi-square test and phi test) is not significant ($p = 0.152$ for both) (this is due to the low number of sample items, because the correlation is otherwise clearly visible). We also tried Fisher's exact test to show whether there is a relationship between the two variables. Considering the significance level of Fisher's test ($p = 0.324$), we have no grounds to reject the null hypothesis that states there is no association between employee satisfaction measurement and reflections.

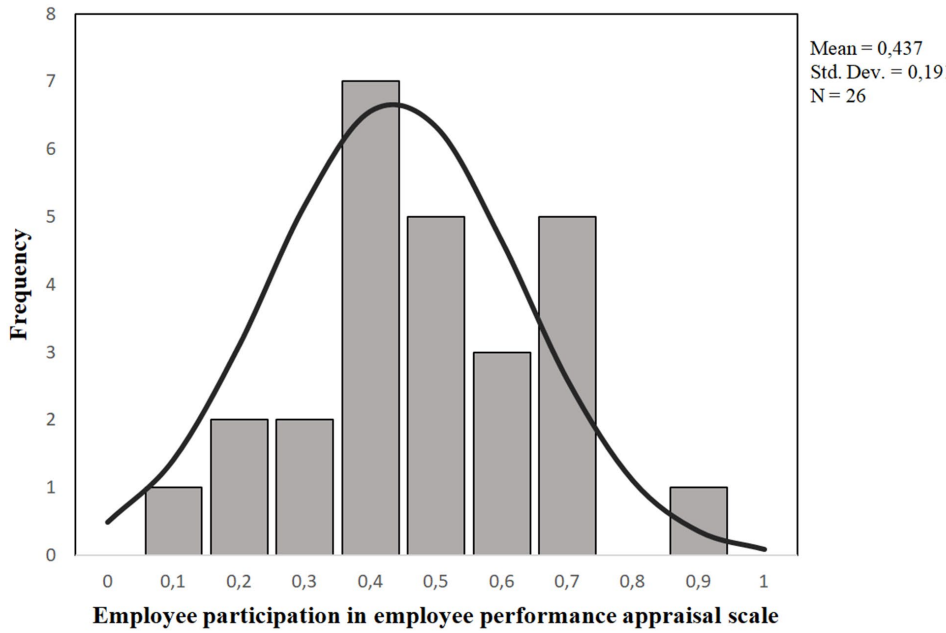

Figure 4
Distribution of employee participation in employee performance appraisal

6. Discussion and conclusion

It is far-sighted that employees have been involved in the development of the PAS, but it is thought-provoking that there are no longer any employees involved in the system's further development. We recommend that evaluated employees be involved in the review of the appraisal system as they certainly have experience, whether positive or negative, of the appraisal process itself. For an effectively functioning PAS, it is essential to be clear about whether the evaluation is being done in accordance with the desired PM objectives, and whether the system is suitable for measuring worker performance. In the previous research section, we noted that an employee PA was performed at the Nagykőrös Rehabilitation Specialist Hospital. After the evaluations were completed, a much shorter survey was conducted to examine how

Table 5
Employee satisfaction measurement vs reflections

			Does the employee have the opportunity to make reflections on their appraisal?				
			No	*Possibly*	Often	*Yes and it is taken into consideration*	*Total*
Is there an employee satisfaction measurement in the hospital?	*No*	*Count*	1				1
		% within SM in the hospital	100%	0	0	0	100%
		% within opportunity to reflect	33.30%				3.70%
	Yes, but the information obtained from it may be used occasionally	*Count*	1	1		9	11
		% within SM in the hospital	9.10%	9.10%	0	81.80%	100%
		% within opportunity to reflect	33.30%	33.30%		45%	40.70%
	Yes, and decisions are based on it	*Count*				5	5
		% within SM in the hospital	0	0	0	100%	100%
		% within opportunity to reflect				25%	18.50%
	We consider it important, measure it, and use the results	*Count*	1	1	2	6	10
		% within SM in the hospital	10.00%	10%	20%	60%	100%
		% within opportunity to reflect	33.30%	50%	100%	30%	37.00%
	Total	*Count*	3	2	2	20	27
		% within SM in the hospital	11.10%	7.40%	7.40%	74.10%	100%
		% within opportunity to reflect	100%	100%	100%	100%	100%

they found the evaluation process and, of course, how much they agreed with the outcome of the appraisal.

We view employee satisfaction measurement as one of the essential components of employee engagement. It is important that the employee has an opportunity to express his or her views in a formal setting. For this reason, we considered it important to examine this issue. In Hungarian hospital practice, employee satisfaction measurement is not meager, being used in a very small percentage, but rather it is used in more than half of it; thus, the measurement practice can be considered remarkable as the obtained results are actually used, albeit to varying degrees. Related to this, the annual employee satisfaction measurement, which is implemented in just over half of the hospitals, is considered adequate. At the same time, this measurement occurs significantly less frequently than annually, which raises certain questions. If an event has occurred that the employee would share, but the possibility of it is much further away in time, it is all the less likely that the employee will share his or her comments about the event. Consideration should be given to linking annual PA and employee satisfaction measurements at a time close to each other.

During the analysis of the participants utilizing the appraisal system, we found that the evaluated workplace leader stands in the first place, which corresponds to the literature's recommendations. This is followed by the evaluated employer and then, with very little difference, the self-appraisal. These three contributors are significant, active features in the evaluation. The person being assessed; i.e. self-appraisal, is a significant element of PAS. It is important to involve the employee in performance planning – part of the performance management cycle already mentioned – because in the view of Gyökér and Krajcsák (2009), goal and work planning fundamentally influence employee satisfaction. This is also supported by the research of Njeri and Nasieku (2018) which shows that human resource planning has a positive effect on employee performance. In connection with this, it is a welcome fact that the vast majority of the employees receive some form of feedback on the appraisal, in written form, which also presupposes a serious intention on the part of the employer. An important part of appraisals is that the employee has the opportunity to make reflections on the appraisal, and they are often taken into account in nearly three quarters of the cases. Organizational culture influences employee engagement (Krajcsák 2018), and precisely for this reason, it is essential whether employees have the opportunity to make comments in general in the organizational culture. A relaxed, constructive workplace atmosphere can facilitate open communication between employer and employee. This communication can contribute not only to defining performance and clarifying expectations, but also to increasing employee satisfaction.

It was found that where an employee satisfaction measurement exists, an opportunity for the assessee to formulate reflections becomes available. Based on these, it can be stated that the employee remains an active participant in the

Hungarian performance appraisal systems, that they are involved in the appraisal, and that their views are taken into account. Although not outstanding, the employee is considered a partner in the appraisal of his work. As we do not know whether such research results have been produced in Hungary so far, we hope that we will be able to enrich employee evaluations with valuable aspects.

7. Limitations and future research

As mentioned earlier, this investigation has a top-leading perspective; for this reason, employee insights are lacking. In order to fully analyze the employee performance appraisal, it is definitely necessary to involve the employees in the study.

It is also necessary to study the practice of measuring employee satisfaction itself. It may be worth going deeper, e.g., how it is structured, what is included in the employee satisfaction measurement, and the extent to which managers use the information they receive.

References

Aishwarya M. Patil & C.S. Dalvi (2019) '720 Degree Performance Appraisal Systems', *International Journal of Trend in Scientific Research and Development, Special Issue, Fostering Innovation, Integration and Inclusion Through Interdisciplinary Practices in Management*, 4–8 (https://doi.org/10.31142/ijtsrd23048).

Bakacsi, G. (2015) *A szervezeti magatartás alapjai* (Budapest: Semmelweis) 12–20.

Bibi, m. & R.A. Khan (2019) 'Improvement of Employee Performance Through HRM Practices Among Hospital Employees in Karachi, Pakistan', *Journal of Humanities and Social Sciences* 2019(2), 17–38.

Bokor, A., K. Szőts-Kováts, S. Csillag, K. Bácsi & R. Szilas (2009) Emberi Erőforrás Menedzsment (Budapest: AULA) 239–60.

Boncz, I., ed. (2011) Egészségügyi finanszírozási, menedzsment és minőségbiztosítási alapismeretek (Budapest: Medicina) 106–8, retrieved 2 Sep 2021 from http://publicatio.bibl.u-szeged.hu/17105/1/SandorneSzaboIringoAzegeszsegugyiminosegbiztositasalapjai.pdf.

Gruman, J.A. & A.M. Saks (2011) 'Performance Management and Employee Engagement', *Human Resource Management Review* 21(2), 123–36 (https://doi.org/10.1016/j.hrmr.2010.09.004).

Gyökér I. & Z. Krajcsák (2009) 'Az alkalmazotti elégedettséget és elkötelezettséget befolyásoló tényezők vizsgálata', *Vezetéstudomány - Budapest Management Review* 40(ksz) 56–61 (https://doi.org/10.14267/VEZTUD.2009.ksz.09).

Hermel-Stănescu, M. (2015) 'The Role of Performance Appraisal in the Context of Performance Management Systems', *SEA – Practical Application of Science* III, 1(7), retrieved 2 Sep 2021 from https://seaopenresearch.eu/Journals/articles/SPAS_7_38.pdf.

Hsieh, J.Y. (2016) 'Spurious or True? An Exploration of Antecedents and Simultaneity of Job Performance and Job Satisfaction Across the Sectors', *Public Personnel Management* 45(1) 90–118 (https://doi.org/10.1177/0091026015624714).

Jabeen, M. (2011) 'Impact of Performance Appraisal on Employees Motivation', European Journal of Business and Management 3(4), 197–205, retrieved 2 Sep 2021 from https://citeseerx.ist.psu.edu/viewdoc/download?-doi=10.1.1.819.8478&rep=rep1&type=pdf.

Jenkins, A. (2005) 'Performance Appraisal Research: A Critical Review of Work on "The Social Context and Politics of Appraisal" ', *(ESSEC) Working Papers* DR 05004.

Kariithi, J.W. & M.O. Ogutu (2016) 'Impact of Strategic Human Resource Management Practices on Organizational Performance (A Case Study of Safaricom)', *Human Resource and Leadership Journal* 1(1), 1–18 (https://doi.org/10.47941/hrlj.23).

Karoliny, M-né. & J. Poór, eds. (2010) *Emberi erőforrás menedzsment kézikönyv* (Budapest: CompLex Kiadó Jogi és Üzletitartalom Szolgáltató Kft) 283–323.

Kim, T. (2014) *Performance Appraisal: Determinants of Public Employee's Acceptance* (PhD diss., Newark: The State University of New Jersey).

Krajcsák Z. (2018) 'Relationships Between Employee Commitment and Organizational Cultures: A Theoretical Framework', *International Journal of Organizational Analysis* 26(3) 398–414 (https://doi.org/10.1108/IJOA-05-2017-1174).

Misiak, S. (2010) 'Ethical System for Employee Performance Appraisal in Practice', *Economics & Sociology* 3(2), 101–13, retrieved 2 Sep 2021 from https://www.economics-sociology.eu/files/12%5b6%5d.pdf.

Njeri Chege, E. & T. Nasieku (2018) 'Effect Of Human Resource Management Practises on Employee Performance in Public Hospitals in Kenya: A Case of Nairobi County', *International Journal of Social Sciences and Information Technology* 5(5), 438–49, retrieved 2 Sep 2021 from https://www.ijssit.com/main/wp-content/uploads/2019/05/Human-Resource-Management-Practices-On-Employee-Performance-In-Public-Hospitals-In-Kenya.pdf.

Nure, G. (2018) Performance Evaluation of Employees in Hospital Service, retrieved 2 Sep 2021 from https://www.researchgate.net/publication/326543574_PERFORMANCE_EVALUATION_OF_EMPLOYEES_IN_HOSPITAL_SERVICE_Content_content.

Salau, O.P., E.E. Oni-Ojo, H. Falola & J.I. Dirisu (2014) 'Modelling the Relationship Between Performance Appraisal and Organizational Productivity in

Nigerian Public Sector', *International Journal of Research in Management* 6(4), 59–74.

Sárga, N.Z. (2016) 'Teljesítményértékelés a Nagykőrösi Rehabilitációs Szakkórház és Rendelőintézet Központi Fizioterápiás Osztályán', *IME Interdiszciplináris Magyar Egészségügy* 15(8), 11–14.

Sárga, N.Z. (2017) 'Eredmény megközelítésű dolgozói teljesítményértékelési rendszerek a Dél-Alföldi Térség kórházaiban', *PEME XIV. PhD. – Konferencia*, 126–136, retrieved 4 Sep 2021 from https://peme.hu/wp-content/uploads/2017/04/XIV.-Konferencia-PEME.pdf.

Sing, R.D.R & S. Vadivelu (2019) 'A Study on Employee Performance Appraisal System in Hospitals — With Respect to Hospitals in Vellore City', *Indian Journal of Public Health Research & Development* 10(6), 233–37.

Takács, S. (2000) *A szervezeti kultúra hatása a szervezet teljesítményértékelési gyakorlatára: A vezetői* értékelési *magatartás empirikus vizsgálata* (PhD diss., Budapest: Budapesti Közgazdaságtudományi és Államigazgatási Egyetem).

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