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# The effect of psychological and behavioral problems on the quality of life of children and adolescents based on self-reports and proxy reports

Enikő Kiss<sup>1\*</sup> , Olney Rodrigues de Oliveira<sup>2</sup>, Eszter Wittmann<sup>1</sup>, Zita Herczegh<sup>1</sup> and Krisztina Kapornai<sup>1</sup>

## Abstract

**Purpose** Investigations of the quality of life (QoL) of young people have shown that psychological and behavioral problems are associated with lower subjective well-being. The QoL ratings of children and adolescents based on self-reports and proxy reports are significantly different. The aim of the present study was to examine youth self-reported and parent proxy-reported QoL and investigate the effects of age, gender and psychological/behavioral symptoms on the QoL reports of youth. We hypothesized that self-reported emotional and anxiety problems influence self-reported QoL, while proxy-reported behavioral problems influence proxy reports of QoL.

**Methods** The sample consisted of 284 parent–child pairs. Youths were between the ages of 11 and 18 years, the mean age was 14.3 (SD 2.1) years, and 35.6% were males. The Inventory of Life Quality (ILK) scale was used to measure QoL, and the Strengths and Difficulties Questionnaire was used to assess psychological and behavioral problems.

**Results** Males had higher self-reported QoL than females, and younger children had better QoL than older children. Emotional peer problems and hyperactivity reported by youth and hyperactivity and conduct problems reported by parents predicted youth self-rated ILK. Only parent-reported psychological/behavioral problems predicted proxy-rated ILK.

**Conclusion** The evaluation of QoL of children and adolescents should involve both self and proxy reports in order to capture the effects of various psychological/behavioral symptoms and the perspectives of both youth and parents.

**Keywords** Quality of life, Children, Adolescents, Self-reports, Proxy reports

\*Correspondence:

Enikő Kiss

kiss.eniko.magdolna@szte.hu

<sup>1</sup>Department of Pediatrics and Pediatric Health Center, Child and Adolescent Psychiatry, University of Szeged, Szeged, Hungary

<sup>2</sup>Universidade Aberta do Brasil, Universidade Estadual do Ceará, Fortaleza, Brazil



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## Introduction

The prevalence of mental health problems in children and adolescents is approximately 12–13% worldwide [1, 2] and is increasing [3]. Current diagnostic criteria require functional impairment in addition to the presence of symptoms to diagnose a psychiatric disorder. However, there is an increasing consensus that a third dimension is also necessary to describe mental disorders and their impact on an individual's quality of life (QoL) [4]. There is a clear distinction between impairment and QoL. The first is an objectively measured assessment of the deviation from the mean for a broad range of functional domains, usually rated by the clinician. The second is a subjective measure based on internal standards generated by the patients [5, 6]. Therefore, QoL can provide important information about self-perceived well-being beyond considering only psychopathology [7] and functional impairment [6].

QoL is a multidimensional construct that is defined in several ways. One of the most complex definitions is provided by the World Health Organization [8], which explains QoL as a subjective evaluation of one's perception of their reality relative to their goals, as observed through the lens of their culture and value system. A more specific definition is that of Wallander & Koot [9], which states that QoL can be defined as the combination of objectively and subjectively indicated well-being in multiple domains of life considered salient in one's culture and time while adhering to universal standards of human rights. QoL is strongly influenced by the physical and psychological conditions of individuals. However, QoL is much more than the well-being or ill-being of a person. QoL has been extensively studied in chronic illnesses in adults and frequently in children and adolescents [10–13]. One study even compared QoL among children with different disorders, such as asthma, arthritis, dermatitis, cerebral palsy, cystic fibrosis, diabetes and epilepsy [14].

The role of QoL in the mental and behavioral disorders of youth is less well established, although the number of studies on this topic has recently increased, especially during the outbreak and lockdown of COVID-19 [e.g., 15–18]. Investigations of QoL in youth with specific mental disorders have shown that psychological and behavioral problems are associated with lower subjective well-being. A review by Jönsson et al. [4] identified 41 studies published between 1990 and 2016 that examined the self- and/or proxy-rated QoL of children and adolescents with psychiatric disorders. The majority of the studies included youth with neurodevelopmental disorders, sleep-wake disorders, and elimination disorders; one study investigated children and adolescents with major depressive disorder (MDD), and one investigated children and adolescents with obsessive-compulsive

disorder. Jönsson et al. [4] concluded that both youth self-reports and parent proxy reports indicated worse global QoL in youth with mental disorders than in healthy or typically developing children and adolescents. Other publications compared adolescents with low and high suicide risk [19], attention-deficit and hyperactivity disorder (ADHD) [6], and obsessive-compulsive disorder [20], and another review investigated QoL in oppositional and conduct disorder [21], all showing decreased QoL in these conditions in childhood and adolescence. Jönsson and colleagues [4] noted, however, that there was a lack of studies comparing QoL among individuals with different mental disorders.

Another challenge in investigating the QoL of children and adolescents is the difference related to the perspective of the reporter. Research has shown that the self-rating of youth differs from the proxy-rating of parents. Several researchers have noted low correlations between self-QoL and proxy QoL in typically developing children and adolescents [e.g. 7, 22], in those with chronic illnesses [e.g., cerebral palsy: 23, diabetes mellitus: 13] and in those with mental disorders [MDD: 24, ADHD: 6]. To fully understand the meaning behind the different ratings, it is important to separate what factors influence the QoL ratings of the different reporters.

The gender and age of the youth are two of the most studied demographic factors influencing reports of QoL. Regardless of the population studied (typically developing or burdened by mental illness), younger children show greater self-reported QoL than older children. A lower QoL in adolescents and a higher QoL in children were shown in youth under psychiatric care [25], those with specific psychiatric disorders [e.g., ADHD: 6, tic disorder: 26], those with chronic illness [e.g., diabetes: 13] or typically developing youth [e.g., 22, 27]. Gender-related differences in QoL are not as straightforward. Several researchers have noted that males have better self-reported QoL than females [16, 19, 22]. Dallos et al. [6] and Kiss et al. [24] did not find a difference between males and females in parent-reported QoL in children and adolescents with ADHD and MDD, respectively, but males rated QoL higher than females in self-reports in both studies. Coghill & Hodgkins [27] compared the QoL of youth with ADHD or diabetes and typically developing controls and did not find differences between genders in either self-reports or proxy reports.

We know from the literature that chronic illnesses influence QoL ratings. Since QoL is a subjective feeling of the individual, it is also possible that not only physical symptoms or the treatment burden of chronic illnesses but also the actual physical state influence the ratings. For example, Ombashi et al. [28] examined the relationship between headaches and QoL in children and adolescents and found that the type, frequency and severity of

headaches influenced QoL to varying degrees. Redondo-Thebar et al. [29] showed that youth with high physical fitness had better QoL than those with low physical fitness.

It has been shown that not only clinical diagnoses but also subthreshold symptoms are associated with lower QoL [19]. There is a gap in the literature about the comparison of QoL between children and adolescents with different psychological and behavioral difficulties. The symptoms of some diagnostic categories overlap, which might cause further difficulty in comparing the influence of psychiatric illnesses on QoL. Therefore, the differential effect of psychological and behavioral symptoms on QoL can be more precisely examined by symptom scales instead of psychiatric diagnoses. In general, a greater correlation has been noted for QoL and observable psychological and behavioral symptoms such as hyperactivity or conduct problems than for nonobservable symptoms such as emotional problems [for a review, see 4]. We found only two publications that compared QoL between children and adolescents with different psychological and behavioral symptoms. Celebre et al. [25] studied psychiatric patients and reported that depressive symptoms and anhedonia were associated with almost all self-reported QoL domains. In self-reports and proxy reports, Magai & Koot [22] examined the associations between QoL and different symptoms in Kenyan youth. They found that parent-rated QoL was associated with withdrawn depression, somatic complaints, attention problems and aggressive behavior of the child, while self-rated QoL was influenced by somatic complaints and rule-breaking behavior.

The aim of the present study was to compare youth self-reported and parent proxy-reported QoL of children and adolescents and investigate the effect of self- and proxy-rated psychological and behavioral symptom groups as mental health indicators on both QoL reports. We studied a typically developing population sample enriched with psychiatric inpatients and outpatients to include youth with subthreshold and more severe symptoms to increase variability in QoL reports. The present study hypothesized that self-reported emotional and anxiety problems would influence youth self-reported QoL, while proxy-reported behavioral problems (e.g., hyperactivity and/or conduct problems) would influence parent proxy reports of QoL. We also hypothesized that younger children and males would have greater QoL than older children and females.

## Methods

### Sample

A survey about child mental health was carried out between 2019 and 2021. The original sample consisted of 397 children and their parents [see 30 for a detailed

description of the study), but only complete dyads were included in the present analyses. The resulting 284 parent-child pairs lived in the southern part of Hungary. Some of the youth were recruited from schools in Szeged city (one elementary, one high and one vocational school), and the other part consisted of children receiving in- or outpatient psychiatric treatment at the Child Psychiatry Unit of Szeged University, Hungary. The psychiatric and school samples were analyzed together in the present study to assess the presence of a wide range of psychological and behavioral problems and thus increase the variability in the variables of interest. Children and adolescents were investigated together; we refer to them as youth.

### Procedure

Informed consent was obtained from all individual participants included in the study. Face-to-face tests were performed on the children and parents attending the psychiatric and outpatient departments using paper-and-pencil methods. Participants in the school sample were contacted through the schools. Parents were informed during parent-teacher meetings in the school by study personnel. Youths were provided written information about the study and consent to participate. Parents and/or youth could ask questions by phone or e-mail from study personnel. They both gave their e-mail addresses on the consent form; younger children who did not have their own e-mails were reached by their parents' e-mails. The questionnaires about demographic characteristics were completed by parents, and the questionnaires about QoL and psychological/behavior problems were completed by both reporters. An online testing format was necessary for the school sample due to COVID-19 restrictions during the second half of the study. This study was performed in accordance with the principles of the Declaration of Helsinki. Approval was granted by the Institutional Review Board of the University of Szeged, Hungary (No. 17/2019). Confidentiality and anonymity were carefully protected and ensured during all stages of the study. Consent forms with personal data were stored separately from the rest of the data in a closed file cabinet. Parents and youth were matched by 6-digit numbers, which represented school or psychiatric care, and were numbered consecutively.

### Measures

The Inventory of Life Quality (ILK) was used to measure the QoL of the participants. It can be used for young people aged 6 to 17 years and has child, adolescent and parent versions [31]. The ILK scale was validated in Hungarian youth [32]. Adolescent self-reports and parent-proxy versions were administered in this study. The instrument inquires about satisfaction in 7 areas of

life: school, family, social contact with peers, time spent alone, physical and mental health and satisfaction in general. Each item is rated on a 1–5 Likert scale, with a total score ranging from 0 to 28 points, with higher numbers representing better QoL. The time frame of the questionnaire is the last week. ILK validation in Hungary showed acceptable internal reliability (Cronbach's alpha: 0.73) [32]. The reliability of the ILK in the present study was good for both parents' and youth's self-reports (Cronbach's alpha: 0.808 and 0.823, respectively).

The Strengths and Difficulties Questionnaire (SDQ) is a brief behavioral screening questionnaire used for 11- to 18-year-old youth [33]. The scale has been validated in Hungarian youth [34]. It consists of 25 items that are grouped into 4 problem scales and one positive scale. We used four problem scales in this study (emotional, peer relationship, conduct, hyperactivity/inattention problems). The total score ranges from 0 to 40, with lower scores representing fewer problems. The questionnaire inquires about problems in the past six months. The reliability of the SDQ subscales was mainly in the low-acceptable range and was lowest for the conduct problem subscales (Cronbach's alpha for proxy reported subscales: 0.793–0.639 and for self-rated subscales: 0.790–0.527) in the present study.

Parents provided information about the demographic characteristics of the youth and the family, such as age, gender, living conditions, subjective income, and life events, and rated the current health of the child on a 4-point Likert scale (excellent, good, reasonable,

poor). Psychiatric patient status was also noted, namely, whether the patient was receiving psychiatric care at the time of the study.

### Statistical analyses

Frequency and descriptive analyses of the dependent and independent variables were carried out. Since a normal distribution for the variables of interest was not confirmed, nonparametric tests were used. We assessed bivariate relationships with Spearman's correlation and Mann-Whitney U tests and used the Kruskal-Wallis test to assess multivariate relationships between predictor and control variables. Hierarchical multiple regressions were used to assess the associations between self- and proxy-rated problem subscales and ILK scores. Age, sex and current health are known to influence QoL; therefore, these variables were controlled for in the statistical analyses. We included the control variables as the first step in the multiple regression models: age, sex, current health status and patient status were entered into the equation. The four problematic subscales of the SDQ for both self-reports and proxy reports were entered as the second step. The above analyses were performed with youth self-reported ILK scores first and were repeated for parent proxy-reported ILK scores. Males and females were coded as 1 and 2, respectively. Patient status was a nominal variable (1 for the normal population sample, 2 for the psychiatrically ill sample). An  $\alpha$  level of 0.05 was considered to indicate statistical significance. IBM SPSS 27 (Apache Software Foundation, USA) software was used for the statistical analyses.

**Table 1** Characteristics of the sample ( $N = 284$ )

	mean (SD)	
Youth's age	14.3(2.1)	
Parents' age (years)	47.3 (7.9)	
	N	%
Males	101	35.6
Females	183	64.4
Reporting parent		
Mother	241	85.2
Father	39	13.8
Other	3	1
Subjective income		
Average	164	58.6
Above average	88	31.4
Below average	28	10
Current health		
Excellent	119	42.0
Good	116	41.0
Acceptable	38	13.4
Bad	8	2.8
Parents divorced	92	32.4
Parents living together	179	63.3
Psychiatric treatment	118	41.5

### Results

There were 35.6% males in the sample. Youths were between the ages of 11 and 17.9, and the mean age was 14.3 (SD 2.1) years. A total of 43.1% were in elementary school, 15.9% were in vocational school, 39.9% were educated in high school, and 1.1% did not attend school. The sample characteristics are shown in Table 1.

A total of 41.5% of the sample were child and adolescent psychiatry in- or outpatients. The clinical diagnoses of the subsample under psychiatric care based on the ICD-10 are shown in Table 2.

The mean scores and standard deviations for the youth self-rated and parent proxy-rated ILK and SDQ subscales for males and females are shown in Table 3. Gender differences in ILK ratings were found only in youth self-reports but not in parent proxy reports. Self-reports revealed that males had higher QoL than females. Emotional problems were rated more severely in females by both reporters, while hyperactivity was rated more seriously in males by parents only.

The age of the participating youth showed weak but significant negative correlations with the QoL scores of

**Table 2** Clinical diagnoses of the youth under psychiatric care based on ICD10 (N= 118)

Clinical diagnoses	N	%
Emotional disorder (Major depressive disorder, Emotional disorder NOS)	80	69
Anxiety disorder	44	37.9
Eating disorder	9	7.8
Attention deficit hyperactivity disorder	6	5.2
Obsessive-compulsive disorder	6	5.2
Dyslexia, dysgraphia, dyscalculia	5	4.3
Tic/Tourette disorder	5	4.3
Adjustment disorder	3	2.6
Drug addiction	3	2.6
Conduct disorder	3	2.6
Other (Bipolar disorder, Enuresis, Asperger syndrome)	5	4.3

both reporters (Spearman’s rho self-reported –0.259, proxy-reported –0.168); younger participants had better QoL than older participants. Worse current health was associated with lower QoL in both reporter ratings (Kruskal-Wallis test, 39.3 for self-reports and 55.0 for proxy reports; both  $p < 0.000$ ).

Since COVID 19 resulted in restrictions and school lockdown during the study, we tested for differences in the SDQ and ILK scores before and after COVID 19 outbreak. Information from the school sample was collected during COVID 19-related school closure so we did not have data for comparison. The sample with psychiatric problems included 49 individuals before COVID 19 and 69 individuals during COVID 19. We compared parent- and self-rated ILK and SDQ scores and found significant

differences only in parent-rated SDQ total and conduct problems subscale; problems decreased during COVID 19.

Correlations between youth self-rated ILK and SDQ subscales and parent proxy-rated ILK and SDQ subscales are shown in Table 4. The upper half of the table shows correlations among youth self-reported scores, and the lower half of the table shows correlations among the parent proxy-rated scores. Youth and parent ILK ratings were significantly correlated (Spearman’s rho: 0.617). Correlations between self- and proxy-ratings of the SDQ subscales were significant, and Spearman’s rho values were between 0.349 and 0.585. The weakest correlation was measured for hyperactivity, and the strongest correlation was measured for the peer problems subscale.

Two hierarchical multiple regression analyses were carried out. First, the youth self-rated ILK score was included as the dependent variable. Age, gender, current health and patient status were entered into the model first, followed by self-rated and parent-rated SDQ Emotional, Peer problems, Hyperactivity and Conduct Problem Subscales. The results are shown in Table 5. All predictors entered first were significant and explained 34.6% of the variance in self-rated ILK. Youth self-rated Emotional, Peer problems and Hyperactivity subscales and parent proxy-rated Hyperactivity and Conduct Problem subscales proved to be significant predictors of ILK in addition to psychiatric patient status. The final model ( $F(8, 260) = 41.682, p < 0.000$ ) explained 65.8% of the variability in self-rated ILK.

**Table 3** Self- and proxy-rated ILK and SDQ scores by gender of the youth

	Youth self-rated scores					Parent proxy-rated scores				
	Males		Females		p	Males		Females		p
	N	Mean (SD)	N	Mean (SD)		N	Mean(SD)	N	Mean (SD)	
ILK	99	21.1 (3.9)	182	18.7 (5.4)	0.000	98	21.6 (4.5)	180	20.8 (4.2)	0.830
SDQ Emotional Problems	100	2.7 (2.3)	183	5.0 (2.9)	0.000	101	2.6 (2.4)	183	4.1 (2.6)	0.000
SDQ Peer Problems	101	2.7 (2.1)	181	2.7 (2.0)	0.104	101	2.5 (2.3)	182	2.6 (1.9)	0.415
SDQ Hyperactivity	101	4.2 (2.2)	182	4.4 (2.2)	0.553	101	3.9 (2.9)	183	2.6 (2.1)	0.000
SDQ Conduct Problems	101	2.6 (1.6)	183	2.4 (1.5)	0.489	101	2.0 (1.9)	183	1.6 (1.6)	0.172

Note ILK: Inventory of Life Quality; SDQ: Strengths and Difficulties Questionnaire, statistics: Mann-Whitney U test

**Table 4** Correlations between youth- and parent-rated ILK and SDQ subscales

Parent proxy-ratings	ILK	Youth self-ratings			
		SDQ subscales			
		Emotional problems	Peer problems	Hyperactivity/Inattention	Conduct problems
ILK	0.617*	-0.649*	-0.636*	-0.442*	-0.334*
SDQ	-0.619*	0.515*	0.527*	0.343*	0.225*
Emotional problems					
SDQ Peer problems	-0.568*	0.511*	0.585*	0.297*	0.275*
SDQ	-0.391*	0.263*	0.204*	0.349*	0.451*
Hyperactivity/ Inattention					
SDQ	-0.490*	0.369*	0.303*	0.536*	0.452*
Conduct problems					

Note Spearman’s rho, \*:  $p < 0.05$ ; ILK: Inventory of Life Quality; SDQ: Strengths and Difficulties Questionnaire

**Table 5** Regression analysis of self-reported QoL

Effect	Estimate	SE	95% CI		p
			LL	UL	
Model 1.					
Constant	39.952	1.665	31.706	38.099	0.001
Gender	-1.761	0.425	-2.611	-0.939	0.001
Age	-0.335	0.116	-0.563	-0.110	0.004
Current health	-0.902	0.365	-1.660	-0.181	0.013
Patient status	-4.318	0.604	-5.508	-3.074	0.001
Model 2.					
Constant	31.756	1.385	28.987	34.434	0.001
Gender	-0.526	0.396	-1.320	0.305	0.182
Age	-0.130	0.090	-0.294	0.047	0.162
Current health	-0.239	0.280	-0.797	0.302	0.393
Patient status	-1.996	0.514	-3.007	0.996	0.001
Parent SDQ Emotional	0.006	0.112	-0.206	0.227	0.969
Parent SDQ Peer problems	-0.074	0.146	-0.357	0.223	0.597
Parent SDQ Hyperactivity	0.225	0.103	0.027	0.429	0.031
Parent SDQ Conduct	-0.427	0.170	-0.779	-0.099	0.014
Child SDQ Emotional	-0.551	0.100	-0.755	-0.343	0.001
Child SDQ Peer problems	-0.665	0.141	-0.949	-0.387	0.001
Child SDQ Hyperactivity	-0.428	0.110	-0.646	-0.198	0.001
Child SDQ Conduct	-0.096	0.181	-0.440	0.271	0.609

Note SDQ: Strengths and Difficulties Questionnaire

**Table 6** Regression analysis of proxy reported QoL

Effect	Estimate	SE	95% CI		p
			LL	UL	
Model 1.					
Constant	31.959	1.382	29.072	34.536	0.001
Gender	-0.041	0.417	-0.848	0.758	0.930
Age	-0.134	0.096	-0.315	0.057	0.164
Current health	-1.267	0.306	-1.883	-0.649	0.001
Patient status	-4.730	0.448	-5.562	-3.760	0.001
Model 2.					
Constant	31.907	1.170	29.633	34.082	0.001
Gender	-0.027	0.410	-0.856	0.780	0.949
Age	-0.110	0.077	-0.254	0.048	0.144
Current health	-0.814	0.243	-1.269	-0.312	0.001
Patient status	-2.525	0.454	-3.359	-1.575	0.001
Parent SDQ Emotional	-0.299	0.104	-0.496	-0.088	0.007
Parent SDQ Peer problems	-0.581	0.122	-0.799	-0.317	0.001
Parent SDQ Hyperactivity	-0.104	0.093	-0.294	0.079	0.254
Parent SDQ Conduct	-0.348	0.141	-0.626	-0.067	0.017
Child SDQ Emotional	-0.061	0.093	-0.755	-0.124	0.521
Child SDQ Peer problems	0.052	0.122	-0.196	0.281	0.686
Child SDQ Hyperactivity	-0.121	0.090	-0.296	0.062	0.170
Child SDQ Conduct	-0.061	0.159	-0.381	0.261	0.704

Note SDQ: Strengths and Difficulties Questionnaire

Next, parent proxy-rated ILK was included as the dependent variable, and the four proxy-rated and four self-rated SDQ subscales were the independent variables. Age, gender, current health and psychiatric patient status were entered into the model first to control for their

effect, followed by the parent-rated and self-rated SDQ Emotional, Peer Problems, Hyperactivity and Conduct Problem subscales. The results are shown in Table 6. The first model was significant and explained 45.5% of the variance in proxy-rated ILK. Parent-rated emotional, peer problems and conduct problems proved to be significant predictors, while none of the youth self-rated SDQ scores were significant predictors. The final model ( $F(8, 257)=39.764, p<0.000$ ) explained 63.4% of the variability in proxy-rated ILK (Table 6).

## Discussion

The aim of the present study was to investigate the effect of psychological and behavioral symptoms on youth self-rated and parent proxy-rated QoL. We also tested for the effect of age, gender, and current health of the child to determine how these characteristics influenced the ratings.

We hypothesized that self-reported internalization-type symptoms (such as emotional and anxiety difficulties) would influence youth-rated QoL, while proxy-reported externalizing-type symptoms (hyperactivity and conduct problems) would influence parent proxy reports. According to our results, self-reported internalizing-type symptoms and hyperactivity/inattention symptoms experienced by young people and externalizing-type symptoms observed by parents were predictors of QoL, while only proxy-reported symptom groups predicted the parent-reported QoL of young people. Youth self-reported QoL seems to be a more complex measure that captures the effects of various psychological/behavioral symptoms and the perspectives of both youths and parents. Alamolhoda et al. [35] compared youth self- and parent proxy-rated QoL and concluded that they measured different aspects of QoL and were not interchangeable. Although asking parents about various symptoms and qualifiers of youth is still an everyday practice, it is critical for clinicians to realize that parents are not always reliable informants of their offspring [36]. The evaluation of QoL should involve young people, especially adolescents, since their opinions include both self- and proxy-rated emotional and behavioral symptoms. The parental QoL ratings were not associated with any of the youth-rated symptom groups.

Studies where parents report on psychopathology and parents or youth report on QoL will result in limited information [23]. Taking into consideration the difficult task of the parent when trying to rate their child's subjective well-being, Jönsson et al. [4] suggested that the quality of proxy ratings might be improved by explicitly guiding the rater to take the child's perspective. This could, however, result in the loss of information from the proxy perspective. Helping open communication between parents and youth and assisting parents in

understanding youths' level of functioning across different domains may improve care for various psychological and behavioral problems [36] and increase knowledge about the subjective quality of life.

The parent-rated QoL of the youth was only predicted by parent-rated psychological and behavioral symptoms. In contrast to their offspring, their QoL ratings were influenced only by observed emotional, peer and conduct problems. The finding that internalization-type symptoms predicted parental QoL ratings might be explained by the high percentage of youth under treatment for affective and anxiety disorders in our sample. It is likely that the parents of these young people were more aware of the emotional problems of their youth, which influenced their overall associations [4]. The strong influence of peer problems might be explained by a closer look at the specific questions of the SDQ subscale. Friendship, openness to other children and adolescents and getting on with them are usually observable by parents as much as they are experienced by the youth themselves. This subscale showed a strong correlation with emotional problems and QoL in both self-reports and proxy reports.

Self-reports and proxy reports of QoL show low to moderate correlations in the literature [6, 13, 22–24]. Our results were greater than usual associations, which might be explained by the sample characteristics. Our sample included a high percentage of mothers as parental informants and more girls. It has been shown in the literature that mothers are better proxies than fathers due to general parenting practices such that mothers have a role of care and nurturing in the family [36] and that parent-child pairs of the same gender have better concordance [36].

We found a significant effect for age in both self-reports and proxy reports, such that younger youth had better QoL than older youth. Our results are in line with the literature [6, 13, 22, 25–27, 36]. As children grow older, they might become more aware of their problems, which could explain their lower self-ratings [37]. Parents usually have more tension with adolescents than with younger children, which might result in worse QoL ratings for both the adolescents and their parents. For adolescents under psychiatric care, the possible chronicity of their psychiatric problems might result in lower QoL [37]. According to our results, males had better self-reported QoL than females. Some researchers have observed similar results [e.g. 6, 16, 19], but other researchers [e.g., 25, 27, 38] have not found significant gender differences in various samples of children and adolescents. An explanation might be the gender-age interaction effect. Michel et al. [39] found in a large-scale European survey that boys and girls aged 8 years had similar QoL, and the scores decreased continually with increasing age for both

genders. A meaningful difference was detected from ages 13–14 onward, and there was a more pronounced decrease in QoL in girls than in boys. This finding is also in line with the increased mood disorder prevalence in females observed in adolescence [40] and the strong correlation of QoL with internalization-type psychological symptoms [24].

Our results underlined the effect of current health on QoL. The importance of self-rated health and its association with QoL has been shown in other studies [see, e.g., 41, 42]. It is advisable for all QoL studies to take into account the actual physical state or current health of the participants in addition to demographic, family factors, psychological/behavioral symptoms or psychiatric diagnoses.

Despite these important results, our study has several limitations. Since this study was cross-sectional, it was not possible to draw causal conclusions. Longitudinal follow-up studies are needed to assess causal relationships. We used a single QoL score; therefore, we could not study the relationship between psychological and behavioral symptoms and specific domains of QoL. Despite the high variability in self- and proxy-reported QoL explained by our results, there are still other factors to consider. The inclusion of parental psychopathology or child self-esteem, for example, would probably further increase the strength of the analyses. Due to COVID-19 restrictions, typically developing and psychiatric samples were examined by different methods. This difference was accounted for by including psychiatric care as a control variable in the analyses. The differences in the time frames of the questionnaires used in the study might also be a limitation. Since QoL is a subjective state, it is important to inquire about a recent and relatively short time period. At the same time, most of the psychological and behavioral problems are present for a longer time. Therefore, the measure of these different variables is most accurate keeping these time windows.

In conclusion, our study demonstrated that both youth self-ratings and parent-proxy ratings are reliable measures of QoL since they are associated with different types of mental health symptoms rated by self and proxies. The most accurate report can be obtained by asking both reporters. Considering subjective QoL as an additional dimension in monitoring and caring for youth with mental health problems provides valuable information on the effectiveness of therapy and long-term care.

#### Author contributions

All the authors contributed to the study conception and design. Material preparation and data collection were performed by O. R. O., E. K. W., Z. H. and E. K., and analysis was performed by E. K. and O. R. O. The first draft of the manuscript was written by E. K., and all the authors commented on previous versions of the manuscript. All the authors have read and approved the final manuscript.

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### Data availability

Data can be required from the corresponding author by e-mail.

### Declarations

#### Ethical approval

This study was performed in accordance with the principles of the Declaration of Helsinki. Approval was granted by the Institutional Review Board of the University of Szeged, Hungary (No. 17/2019).

#### Consent to participate

Informed consent was obtained from all individual participants in the study.

#### Disclosure

The authors have no relevant financial or nonfinancial interests to disclose.

#### Competing interests

The authors declare no competing interests.

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