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Determinants of quality of life in children with psychiatric disorders

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Abstract

Objective: To assess factors that, in addition to childhood psychopathology, are associated with Quality of Life (QoL) in children with psychiatric problems. *Methods*: In a referred sample of 252 8 to 18-year-olds, information concerning QoL, psychopathology and a broad range of child, parent, and family/ social network factors was obtained from children, parents, teachers and clinicians. *Results*: Poor child, parent, and clinician reported QoL was associated with child psychopathology, but given the presence of psychopathology, also with child factors, such as low self-esteem, and poor social skills, and family/social network factors, such as poor family functioning, and poor social support. In multiple linear regression analyses the importance of parent factors, such as parenting stress, was almost negligible. *Conclusion*: To increase QoL of children with psychiatric problems, treatment of symptoms is important, but outcome might improve if treatment is also focussed on other factors that may affect QoL. Results are discussed in relation to current treatment programs.

Key words: Child/parent/family factors, Children, Psychiatry, Quality of Life

Introduction

Several studies have shown that Quality of Life (QoL) is poor in children with psychiatric disorders [1, 2]. It has been reported that QoL in children with psychiatric disorders is not only considerably poorer than that of children from the general population, but also comparable to or even poorer than that of physically ill children [1–3], indicating that there is an association between poor QoL and child psychopathology. These findings underscore the need for QoL assessment in children with psychiatric disorders. Since recent studies have shown that psychopathology is persistent from childhood into adulthood [4, 5], it is desirable to reveal factors that, besides child psychopathology, are associated with QoL in children with psychiatric disorders. These factors could then, along with psychiatric symptoms, be chosen as a focus of treatment. Improving possible mediating factors, such as family circumstances or the social skills of the child might provide important opportunities to improve QoL. To our knowledge, studies that examined factors that may explain differences in QoL, over and above psychopathology, in children with psychiatric disorders, are not available.

The aim of the present study was to assess which factors, besides child psychopathology, are associated with QoL in children with psychiatric problems. To identify these factors, the Bronfenbrenner model was employed [6]. According to this model, factors influencing a child's development may be ordered from more proximal to more distal, i.e. at the child level, parent level, and family/ social network level. Proximal factors are hypothesized to be more influential than distal ones, and distal factors are assumed to exert their influence mainly through more proximal ones. In this study, factors possibly influencing a child's QoL were ordered similarly. Associations between

QoL and child, parent, and family/social network factors were assessed over and above the association between QoL and child psychopathology.

At the child level, the present study assessed the association between QoL and presence of a chronic physical disease and low self-esteem, over and above the association between QoL and psychopathology, because both of these factors have previously been associated with QoL. Several studies among children reported an association between poor QoL and presence of a chronic physical disease [7] and studies among adults with psychiatric disorders showed an association between poor QoL and low self-esteem [8]. However, until now, no study has examined the association between QoL and these factors in children with psychiatric problems. Further, this study examined whether other child factors – intelligence, and poor social skills – were correlated with QoL, because previous studies found an association between these factors and level of psychopathology [9, 10]. It is likely that these factors also affect QoL, although this has not been studied previously.

At the parent level of the Bronfenbrenner model, the present study assessed the association between QoL and psychopathology in mothers, mothers' mental health service use, and parenting stress. Although their association with child QoL has not yet been addressed, several studies found an association between these factors and level of psychopathology in children [11, 12]. It could be possible that these factors also affect QoL.

At the family/social network level, associations between QoL and family composition, family socio-economic status (SES), social contacts of the family, and perceived social support were assessed, because previous studies found an association between QoL and these factors. Family composition was associated with poor QoL in adults with psychiatric disorders [13]. SES has been found to affect QoL in children with asthma [14]. Studies in children with chronic physical disorders reported a positive association between QoL and social functioning of the family [15]. Perceived social support was correlated with better QoL in adult psychiatric patients and in children with chronic physical disorders [13, 16]. Further, at the family/social network level, the association between QoL and family functioning and stressful life events was studied. Previous studies reported a correlation between these factors and level of psychopathology [17, 18]. However, the relation between QoL and these factors is still unknown.

In summary, besides the assessment of the association between child psychopathology and QoL, factors possibly associated with QoL were assessed at three levels: child, parent, and family/social network level. To our knowledge, studies that examined the relation between such factors and QoL in children with psychiatric problems, and that determined the importance of factors from each level, compared to factors from other levels, are not yet available. Since this is the first study that examined this relation, the goal was not to construct an elaborated theoretical framework of factors associated with QoL, but to perform explorative analyses. To assess the independent contribution of factors associated with QoL, i.e. over and above the influence of psychopathology, measures of child psychopathology were included in the analyses before other factors were entered. We hypothesized that child psychopathology would be strongly associated with poor QoL and that QoL would be poorer in children with male gender and older age. At the child level, QoL was expected to be poorer in children with chronic physical disease, low self-esteem, lower intelligence, and poor social skills. Further, at the parent level, we expected QoL to be compromised by parental psychopathology, parental mental health service use, and high levels of parenting stress. Finally, at the family/social network level, QoL was expected to be negatively influenced by single parent family, low family SES, poor social contacts of the family, poor social support, poor family functioning and stressful life events.

Methods

Procedure and participants

The target sample of this study consisted of consecutive referrals of children and adolescents aged 8–18 years who had been referred to two outpatient child psychiatric clinics in the Netherlands. The present sample was part of a larger study, which was described elsewhere [3]. During their first visit to the clinic, children and their parents were informed on the QoL study by a clinician and

their participation was asked. Written informed consent was obtained from both children and parents. Children and parents filled in questionnaires concerning QoL, psychopathology and a broad range of child, parent, and family/social network factors. The child's clinician provided information on functional impairment of the child. After consent of parents and children, teachers filled in questionnaires regarding psychopathology and the child's social skills. The study was conducted after approval by the university hospital medical ethical committee.

Of the 364 children and their parents who were asked to participate, 252 (69.2%) agreed to participate, 91 (25.0%) refused, and 21 (5.8%) were excluded because of language problems or because they could not be reached, leaving a final response of 73.5%. The mean age of the total sample of 145 boys (57.5%) and 107 girls (42.5%) was 12.2 years (SD = 2.8; range 8.0–18.2 years); 34.9% of the children came from families with low SES (determined through parental occupational level [19]) and 65.1% from middle-high SES families. Based on the main clinical diagnosis, that was obtained with the DSM-IV Checklist Interview in a standardized way [20], each of the children was assigned to one of six diagnostic groups: (1) Attention Deficit and Disruptive Behavior Disorders (n = 79, 31.4%), (2) Anxiety Disorders (n = 50, 19.9%), (3) Mood Disorders (n = 23, 9.1%), (4) Pervasive Developmental Disorders (n = 19, 7.5%), (5) Other Disorders (n = 20, 7.9%; including Somatoform Disorder and Enuresis/Encopresis), and (6) Referred – No Diagnosis (n = 61, 24.2%). Children from each of these six categories were included in all analyses. The validity of the DSM-IV Checklist Interview, as applied in this study, was supported by Bastiaansen et al. [2].

Completed questionnaires of both child and parent were available in 240 cases (95.2%), of the child only in 3 cases (1.2%) and of the parent only in 9 cases (3.6%). Ninety percent of the questionnaires were obtained from mothers, and 10% from fathers. Information concerning parental psychopathology and parenting stress was only obtained from mothers and not from fathers. Information from clinicians was available for all 252 children and teacher information for 199 out of the 252 children (79.0%).

Instruments

QoL measures

*Pediatric Quality of Life Inventory™ Version 4.0 (PedsQL).*To measure the child's QoL the 23-item PedsQL [21] was used, which has a child self-report and a parallel parent proxy-report format. Versions for ages 8–12 and 13–18 years were used. The instructions ask the respondent to indicate how much of a problem an item has been for the child during the past month. By formulating the instruction in this way, the informant is not asked to rate the presence of a certain behavior, but if present, its impact on the child's everyday functioning. The items are scored on a 5-point Likert scale (0, 25, 50, 75, 100). Scores may range from 0–100, from 'almost always a problem' to 'never a problem'; higher scores indicating better QoL. Four subscales and a Total Score can be computed, covering the following dimensions of QoL: (1) physical functioning (8 items; e.g. 'hard to do sports' or 'having hurts'); (2) emotional functioning (5 items; e.g. problems with 'feeling angry' or 'trouble sleeping'); (3) social functioning (5 items; e.g. 'trouble getting along with peers' or 'being teased'); and (4) school functioning (5 items; e.g. 'trouble keeping up with schoolwork' or 'missing school'). In the present study we only used the Total Score, computed as the sum of the 23 items divided by the number of items answered. Good reliability and validity were reported for the American [21] and Dutch version [3] of the PedsQL.

*Child and Adolescent Functional Assessment Scale (CAFAS).*The CAFAS [22] is a rating scale to be completed by the child's clinician and designed to measure functional impairment across multiple domains of functioning in children and adolescents. In this study, it was used as an instrument to measure QoL from the perspective of the clinician. Impairment is operationalized as the degree to which the child's problems interfere with his or her functioning in various life roles. The child's functioning is rated on eight domains: (1) role performance – school/work (e.g. 'school grades are below average' or 'frequent absences from school'); (2) role performance – home (e.g. 'comply with rules'); (3) role performance – community (e.g. 'delinquent behavior'); (4) behavior towards others (e.g. 'difficulties in interactions with

friends'); (5) moods/emotions (e.g. 'fears' or 'sad'); (6) self-harmful behavior (e.g. 'harming self'); (7) substance use (e.g. 'usage of alcohol or drugs'); and (8) thinking (e.g. 'thought distortions'). Each domain contains numerous behavioral descriptions that are divided in four categories. Impairment scores are as follows: 30 – severe; 20 – moderate; 10 – mild; or 0 – minimal or no impairment. For each domain, the category is rated that describes the child's most severe level of dysfunctioning during the past 3 months. Clinicians were blind to all information obtained in this study except the data of the Child Behavior Checklist (CBCL [23]) and Teacher's Report Form (TRF [24]).

The Total Child Score is computed as the sum of the scores on the eight domains. Scores were recoded so that higher scores indicated better functioning (range 0–240). Good reliability and validity of the CAFAS have been reported [25]. To enhance reliability in our study, raters were trained in scoring the CAFAS three times during the course of the data collection. Training sessions included instructions on how to score the CAFAS and the scoring of vignettes that were provided by Hodges in the CAFAS manual [22]. Each vignette contained a description of the family constellation and a detailed report of the child's behavior. Crohnbach's alpha for the Total Child Score was 0.67.

Psychopathology measures

The Child Behavior Checklist/4–18 (CBCL [23]) and Teacher's Report Form (TRF [24]) were used as standardized parent and teacher reports of child psychopathology over the preceding 6 and 2 months, respectively. The child's behavior is rated on a 3-point scale (0 = not true, 1 = somewhat true, 2 = very true or often true); both questionnaires contain 120 problem items. In this study, the Total Problem Score was used; higher scores indicate a higher level of psychopathology. Over the years, studies have shown good reliability and discriminative validity of the Dutch CBCL and TRF [26, 27].

Child factors

Intelligence. The Wechsler Intelligence Scale for Children – Revised (WISC-R [28]) was used to measure the intelligence of the child. In 13.9% of the children this was not possible, because their IQ was too low to be measured (n = 12) or because their age was above the age range (>16 years) for which WISC-R norms are available (n = 23). Self-report questionnaires were not obtained from the low IQ children of the first group (n = 12).

Chronic physical disease. The Questionnaire for Identifying Children with Chronic Conditions (QuICCC [29]) was used to assess the presence of a chronic physical disease. The QuICCC consists of 39 items and each item consists of three sequences. The first part of each question sequence asks about one or more specific consequences of having a chronic health condition; the second level asks whether the consequence is the result of a medical, behavioral, or other health condition; and the final part assesses the duration of the condition (which has to be at least one year). To meet the definition of a chronic disease, a child must qualify in each component of at least one question sequence. Good reliability and validity of the QuICCC have been demonstrated [29].

Self-esteem. Children completed the Global Self-Worth Scale of either the Self-Perception Profile for Children (SPPC; ages 8–12 [30]) or the Self-Perception Profile for Adolescents (SPPA; ages 13–18 [31]), consisting of six or five 4-point items, respectively. High scores indicate high self-esteem. Harter [30, 31] reported good reliability and validity of the Global Self-Worth Scale of the SPPC and SPPA. The Dutch translation of the SPPC was also found to be reliable and internally valid [32]. In our sample, Crohnbach's alphas were 0.74 (SPPC) and 0.82 (SPPA).

Social skills. Parents and teachers rated children's social skills on separate versions of the Social Skills Rating System (SSRS; [33] for children aged 6–12 or 13–18 years). Parent forms contain 38 and 40 items for ages 6–12 and 13–18 years, respectively; teacher forms contain 30 items for both age groups. In this study, the Total Score was used; higher scores indicate better social skills. Good reliability and validity of the SSRS were reported [33]. In this sample, Crohnbach's alphas were 0.91 (ages 6–12) and 0.89 (ages 13–18) for the parent version and 0.93 (ages 6–12) and 0.90 (ages 13–18) for the teacher version.

Parent factors

Psychopathology mother. Mothers were asked to complete the Young Adult Self-Report (YASR [34]) to assess psychopathology of the mother. The YASR has the same format as the CBCL and concerns the past 6 months. In order to limit the amount of time needed to fill in the questionnaire, we only used those 29 of the 110 problem items, which discriminated best between referred and non-referred subjects [35]. A Total Problem Score was computed by summing the scores on the 29 items, with higher scores indicating higher levels of psychopathology. The Dutch translation of the YASR was found to be a reliable and valid instrument [36]. In this sample Crohnbach's alpha was 0.92.

Psychiatric treatment mother. Maternal mental health use was assessed with a questionnaire on mental health use. Current and past mental health service use, both in an outpatient clinic as in a day-and-night treatment clinic, were assessed.

Parenting stress mother. Mothers completed the Nijmegen Parenting Stress Index (NPSI [37]), which is a modified Dutch version of Abidin's Parenting Stress Index [38], measuring the level of perceived parenting stress originating from several child and parent characteristics within the caregiving context. A short form was used, including 25 items derived from scales measuring the perceived child and parent characteristics [39]. A Total Problem Score was computed by summing the scores on the 25 items, with higher scores indicating higher parenting stress (alpha = 0.95 in this sample).

Family/social network factors

Family composition and family SES were assessed with a questionnaire on family composition, parental education and occupational level. To classify the parental occupational level, the classification system of the Dutch Bureau of Statistics [19] was used, which distinguishes 10 levels, ranging from 0 to 9, with '0' corresponding with unemployment and '9' with academic occupations. These levels can be recoded into three categories: low, middle, and high SES. Low SES is corresponding with levels 0–3, middle SES with 4–5, and high SES with 6–9. In the current study, the family was assigned to one of two categories based on the highest occupational level in the family (father or mother): low SES or middle-high SES.

Family functioning. The child's clinician rated the two scales of the CAFAS [22] indicating whether the caregiver meets the child's material needs and social support. The CAFAS caregiver scales are designed to assess functional impairment in the family. The Total Caregiver Score is computed as the sum of the scores on the two scales. Scores were recoded (ranges 0–60) so that higher scores indicate better caregiver functioning. Hodges and Wong [25] provided evidence for the reliability and validity of the CAFAS.

Parents filled in the General Functioning Subscale of the McMaster Family Assessment Device (FAD [40]). This scale measures the overall health/pathology of the family; items were scored in such a way that higher scores indicate better family functioning. Byles et al. [40] reported good reliability and validity of the General Functioning Subscale. In the present study Crohnbach's alpha was 0.87.

Social contacts family. Parents filled in the Health Insurance Experiment Social Support Questionnaire [41], concerning social contacts and social resources of the family. An Overall Social Contacts Index was computed by summing the nine items. Higher scores indicated more social contacts (alpha = 0.73 in this sample).

Social support. Children completed either the Social Support Scale for Children (SSSC; ages 8–12 [42]) or the Social Support Scale for Adolescents (SSSA; ages 13–18 [43]). These two measures assess child-perceived support from significant others. Three of the four scales of the SSSC/SSSA were used, measuring social support from family members, friends, and classmates. Each subscale consists of six items. Higher scores indicate greater perceived support. We used Harter's 4-point item format for the classmates' scale; the family members and friends scales were slightly changed into a 2-point format. Harter [42, 43] reported good reliability and validity of these three subscales of the SSSC and SSSA. Crohnbach's alphas of subscale scores in the present study were 0.80 and 0.79 for family members, 0.76 and 0.82 for

friends, and 0.71 and 0.68 for classmates, for SSSC and SSSA, respectively.

Life events. Parents completed a 12-item short form of the Life Events Questionnaire [18], which is a yes-or-no format self-report questionnaire assessing potentially stressful life events such as parental divorce, death of a family member, or long-term hospitalization in the past 2 years. The item scores are summed into a Total Life Events score; higher scores indicate more life events.

Statistical analyses

Of all variables and QoL measures, means (or proportions), standard deviations and ranges were computed. Subsequently, simple linear regression analyses were performed between a psychopathology measure, or a child, parent, or family/social network factor as independent variable and a QoL outcome measure as a dependent variable. Finally, multiple linear regression analyses were conducted between the psychopathology measures and all child, parent, and family/social network factors as independent variables and each of the three QoL outcome measures as dependent variable. A forward stepwise method with variables entered in four subsequent blocks was used. Measures of child psychopathology (CBCL and TRF) and the variables, sex and age, were entered in the first block as control variables. The other predictors then were added in subsequent blocks to see if they incremented the prediction of QoL. According to the Bronfenbrenner model, child factors were entered in the second block (intelligence, presence of a chronic physical disease, self-esteem, and social skills), parent factors in the third block (psychopathology mother, maternal mental health service use, and parenting stress), and family/social network factors in the fourth block (family composition, SES, family functioning, social contacts of the family, perceived social support, and stressful life events). In each of the four blocks, interaction terms between sex or age and the other predictors were added. At each step in the regressions, the increment in variance accounted for by the set of variables added at that step was tested for significance. The presence of multicollinearity was detected by means of variance inflation factors (VIF). A maximum VIF value in excess of 10 was taken as an indicator for the presence of multicollinearity [44].

Results

Descriptive analyses

Descriptive information of the variables and outcome measures is presented in Table 1. Variables are presented in groups: biographical status, psychopathology measures, child, parent, and family/social network factors. The present sample seems to be representative of the Dutch population, since the distribution of sex, SES, and family composition is comparable to the distribution of these variables in previous Dutch general population studies [45, 46].

Simple linear regression analyses

Table 2 shows the results of the simple linear regression analyses. Both significant and non significant betas are presented; betas that were significant at $p < 0.05$ are marked. Child psychopathology was correlated with the QoL measures of all three raters. Self-esteem was the only child factor that was significantly associated with all three QoL ratings. Parent report on social skills was significantly associated with both parent and clinician's report on QoL. Surprisingly, intelligence had no significant association with any of the QoL measures.

Regarding parent factors, parenting stress and psychopathology of the mother were associated with a poor QoL in both parent and clinician QoL report. Remarkably, no parent factors were significantly associated with child report on QoL.

Finally, no family/social network factors were significantly associated with all three QoL measures, but several factors were associated with two QoL ratings. Family functioning (parent and clinician report) and social support from family members were associated with a better QoL, in both parent and clinician's QoL judgement. Social support from classmates and stressful life events were associated with child and parent report on QoL.

Table 1. Means (proportions), standard deviations, and ranges of predictor variables and QoL measures

	Instrument	Mean/proportion	SD	Range
Biographical status				
Sex[a]		57.5%		
Age[a]		38.5%		
Psychopathology measures				
Child psychopathology (parent report)	CBCL	63.8	28.5	7–142
Child psychopathology (teacher report)	TRF	50.9	28.1	3–147
Child factors				
Intelligence	WISC–R	96.5	16.0	48–141
Chronic physical disease	QuICCC	8.8%		
Self-esteem	SPPC/SPPA	3.1	0.7	1.2–4.0
Social skills (parent report)	SSRS	42.9	11.9	10–73
Social skills (teacher report)	SSRS	31.2	9.3	7–57
Parent factors				
Psychopathology mother	YASR	10.1	8.6	0–48
Psychiatric treatment mother		35.0%		
Parenting stress mother	NPSI	81.3	28.5	26–139
Family/social network factors				
Single parent family		28.2%		
SES*		65.1%		
Family functioning (clinician report)	CAFAS	52.5	9.1	0–60
Family functioning (parent report)	FAD	3.1	0.5	1.5–4.0
Social contacts family	HIESSQ	3.0	0.7	0.7–5.0
Social support – family	SSSC/SSSA	0.7	0.2	0–1
Social support – friends	SSSC/SSSA	0.8	0.2	0–1
Social support – classmates	SSSC/SSSA	3.2	0.6	1–4
Stressful life events	LEQ	1.5	1.3	0–6
QoL measures				
PedsQL – child report	PedsQL	73.3	12.7	35.9–100
PedsQL – parent report	PedsQL	67.6	14.0	27.2–97.8
CAFAS total child score	CAFAS	197.1	28.3	80–240

[a] Dichotomized variables: sex (girl (0) vs. boy (1)), age (8–12 (0) vs. 13–18 (1) years) and SES (low (0) vs. middle–high (1)).

Multiple linear regression analyses

Table 3 shows the results of the multiple linear regression analyses. Betas are standardized betas for the *full model*, i.e. the value of the beta when all predictors were included; both significant and non-significant betas are presented and betas that were significant at $p < 0.05$ are marked. All three regression models were significant at $p < 0.001$ and no indications were found for the presence of multicollinearity since no VIF factor exceeded the value of 10.

Child psychopathology was associated with the QoL measures of all three raters. The interaction between sex and child psychopathology was correlated with child and parent QoL report and showed that the decrease in QoL with an increasing level of psychopathology (parent reported) was larger for girls than for boys. The interaction between age and child psychopathology demonstrated that a decrease in QoL with an increasing level of psychopathology was larger for older children than for younger children.

Over and above the association between child psychopathology and QoL, several child factors independently contributed to the variance in the regression model. Parent report on social skills was significantly associated with clinician and parent report on QoL. In contrast to the simple analyses, self-esteem was only associated with child report on QoL. The significant interactions between sex or age and chronic physical disease and child QoL report showed that boys with a physical disease experienced a lower QoL than girls with a physical disease and that younger children with a physical disease had a lower QoL than older children.

The interaction between sex and parenting stress of the mother was the only parent factor that made

Table 2. Simple linear regression analyses of factors associated with QoL

Variables	Instrument	QoL measures		
		PedsQL total score – child report	PedsQL total score – parent report	CAFAS total child score
Biographical status				
Sex[a]		0.15[b]	0.09	0.05
Age[a]		0.09	0.07	−0.16[b]
Psychopathology measures				
Child psychopathology (parent report)	CBCL	−0.22[b]	−0.61[b]	−0.43[b]
Child psychopathology (teacher report)	TRF	−0.09	−0.15[b]	−0.28[b]
Child factors				
Intelligence	WISC-R	0.06	0.05	0.08
Chronic physical disease	QuICCC	−0.16[b]	−0.10	−0.02
Self-esteem	SPPC/ SPPA	0.39[b]	0.19[b]	0.18[b]
Social skills (parent report)	SSRS	0.11	0.44[b]	0.37[b]
Social skills (teacher report)	SSRS	0.05	0.07	0.18[b]
Parent factors				
Psychopathology mother	YASR	−0.04	−0.29[b]	−0.29[b]
Psychiatric treatment mother		−0.10	−0.19[b]	−0.01
Parenting stress mother	NPSI	−0.12	−0.44[b]	−0.42[b]
Family/social network factors				
Single parent family		0.10	−0.05	−0.10
SES[a]		0.09	0.11	0.17[b]
Family functioning (clinician report)	CAFAS	0.07	0.25[b]	0.45[b]
Family functioning (parent report)	FAD	0.10	0.28[b]	0.28[b]
Social contacts family	HIESSQ	0.03	0.07	0.07
Social support – family	SSSC/ SSSA	0.01	0.18[b]	0.23[b]
Social support – friends	SSSC/ SSSA	0.05	−0.04	−0.04
Social support – classmates	SSSC/ SSSA	0.37[b]	0.22[b]	0.09
Stressful life events	LEQ	−0.17[b]	−0.24[b]	−0.09

Note: Betas are standardized betas; both significant and non-significant betas are presented.
[a] Dichotomized variables: sex (girl (0) vs. boy (1)), age (8–12 (0) vs. 13–18 (1) years) and SES (low (0) vs. middle-high (1)).
[b] Significant at $p < 0.05$.

a significant improvement to the models. Of all family/ social network factors, social support from classmates, stressful life events and family functioning were significantly associated with the QoL measures. The significant interactions learned that the effect on QoL of stressful life events and social support was larger for boys than for girls.

Discussion

The present study assessed factors possibly associated with poor QoL, over and above the association between QoL and child psychopathology, in children with psychiatric problems. These factors were studied according to the levels of the Bronfenbrenner model. In this model, the first level concerns child characteristics, the second level parent characteristics, and the third level family/social network characteristics. It is important to reveal these factors, because improvement of QoL should be a major aim of child psychiatric treatment [47]. Most treatment programs predominantly focus on psychiatric symptoms, but thus far it is not known which factors, besides psychopathology, influence QoL in children with psychiatric problems. If QoL would be correlated with other factors, besides psychopathology, it might be the case that treatment programs should not only focus on psychiatric symptom reduction, but also on factors enhancing QoL. If a child's psychiatric symptoms would be targeted, while other factors related to QoL would be neglected, this might result in a poor treatment outcome.

As expected, the present study showed a strong association between child psychopathology and

Table 3. Multiple linear regression analyses of factors associated with QoL

Variables	QoL measures		
	PedsQL total score – Child report	PedsQL total score – Parent report	CAFAS total child score
Block 1 (psychopathology measures)			
R^2	*0.10*	*0.43*	*0.22*
Child psychopathology (parent report)	−0.44[a]	−0.81[a]	0.03
Child psychopathology (teacher report)	0.07	0.01	−0.14[a]
Sex[b] × child psychopathology (parent report)[c]	0.40[a]	0.37[a]	–
Age[b] × child psychopathology (parent report)[d]	–	–	−0.21[a]
Block 2 (child factors)			
R^2 change	*0.13*	*0.02*	*0.04*
Intelligence	0.04	−0.01	−0.10
Chronic physical disease	0.01	0.01	0.03
Self-esteem	0.24[a]	0.02	0.03
Social skills (parent report)	−0.06	0.17[a]	−0.03
Social skills (teacher report)	−0.03	−0.03	0.04
Sex[b] × social skills (parent report)[e]	–	–	0.17[a]
Sex[b] × chronic physical disease[f]	−0.44[a]	–	–
Age[b] × chronic physical disease[g]	0.21[a]	–	–
Block 3 (parent factors)			
R^2 change	–	–	*0.03*
Psychopathology mother	0.15	0.02	0.10
Psychiatric treatment mother	−0.10	−0.03	−0.01
Parenting stress mother	0.08	−0.01	−0.01
Sex[b] × parenting stress mother[h]	–	–	−0.16[a]
Block 4 (family/social network factors)			
R^2 change	*0.06*	*0.02*	*0.08*
Single parent family	0.12	−0.01	−0.03
SES	−0.02	−0.03	0.01
Family functioning (clinician report)	−0.05	0.02	0.31[a]
Family functioning (parent report)	0.03	0.02	−0.03
Social contacts family	0.01	−0.06	−0.03
Social support – family	−0.13	0.01	0.06
Social support – friends	0.02	−0.02	−0.06
Social support – classmates	0.07	0.07	0.04
Stressful life events	−0.16[a]	0.05	0.08
Sex[b] × stressful life events[i]	–	−0.14[a]	–
Sex[b] × social support – classmates[j]	0.36[a]	–	–
Cumulative R^2	*0.29*[k]	*0.47*[l]	*0.37*[m]

Note. Betas are standardized betas for the full model; both significant and non-significant betas are presented.

[a] Significant at $p < 0.05$

[b] Dichotomized variables: sex (girl (0) vs. boy (1)) and age (8–12 (0) vs. 13–18 (1) years).

[c] The decrease in QoL with an increase of psychopathology was larger for girls than for boys.

[d] The decrease in QoL with an increase of psychopathology was larger for older children than for younger children.

[e] The increase in QoL with an increase of social skills was larger for boys than for girls.

[f] Boys with a physical disease had a lower QoL than girls with a physical disease.

[g] Younger children with a physical disease had a lower QoL than older children.

[h] The decrease in QoL with an increase of parenting stress was larger for girls than for boys.

[i] The decrease in QoL with an increase of stressful life events was larger for boys than for girls.

[j] The increase in QoL with an increase of social support was larger for boys than for girls.

[k] $F(7, 157) = 9.2$, $p < 0.001$.

[l] $F(4, 160) = 35.7$, $p < 0.001$.

[m] $F(5, 158) = 18.5$, $p < 0.001$.

QoL ratings of children, parents and clinicians. In other words, psychiatric symptoms need to be addressed to improve QoL. In accordance with our hypotheses, several child and family/social network factors were, over and above psychopathology, also associated with QoL. However, of all factors that were studied, the influence of parent factors on QoL was almost negligible. Generally, associations were found across the three QoL raters (children, parents, and clinicians), which underscores the validity of the findings, especially because clinicians were blind to almost all information obtained in this study.

Sex and age effects

Sex and age were associated with QoL in interaction with other predictors. The interaction between sex and child psychopathology indicated that the impact of psychopathology on QoL was larger for girls than for boys. A possible explanation might be that boys exhibit significantly more externalizing behavior problems than girls (e.g. [48]). Children with externalizing behavior problems may not experience their symptoms as problematic, which may explain our findings. Our hypothesis regarding the association between age, psychopathology and QoL, was confirmed. When QoL was reported by the clinician, the impact of psychopathology on QoL indeed increased with increasing age. This may be explained by the fact that older children may be more aware of their problems than younger children, because they are more likely to realize that they are different from their peers. This might influence their report of QoL. The association of older age and lower QoL may also be explained by the chronicity of the child's psychiatric disorder and not solely by the mature cognitive development of older children. However, since the chronicity of the child psychiatric disorder was not measured in the present study, this hypothesis could not further be tested. Despite, it should be noted that most of the children who were included in the present study, were visiting mental health care for the first time.

Interactions between sex and child, parent, and family/social network factors learned that the effect on QoL of prediction factors that were studied was larger for boys than for girls.

Child characteristics

As expected, poor QoL was not only associated with the child's psychopathology, but also with low self-esteem, chronic physical disease and poor social skills. Low self-esteem also co-occurred with poor QoL in studies with adults [8] and presence of a chronic physical disease has been associated with poor QoL in children [49]. Intelligence was not correlated with poor QoL. So, beyond the relation between low intelligence and higher levels of psychopathology [9], level of intelligence does not seem to affect QoL directly.

Parent characteristics

Except the association between the interaction of sex and parenting stress and clinician's QoL report, parent characteristics were only associated with QoL in simple regression analyses. Parent factors were added in the analyses because of their known relation with children's psychopathology. Both mothers' psychopathology and parenting stress were correlated with poor QoL. In other words, children with poor QoL had mothers with higher levels of psychopathology and/or mothers who experienced more parenting stress.

Family/social network characteristics

In contrast to previous studies [14] and to what was expected, only a small association between clinician reported QoL and SES was found and only in the simple regression analysis, indicating that QoL was higher in middle-high SES levels. This is remarkable, since low SES has been mentioned as a risk factor for psychopathology in children [50]. Apparently, SES does not affect QoL beyond its effect on psychopathology.

Poor QoL further co-occurred, as expected, with poor social support and, besides this also with poor family functioning and stressful life events. The significant association between QoL and stressful life showed that children with poor QoL were likely to have experienced more stressful life events. Apparently, stressful life events not only influence a child's QoL through their known association with child psychopathology [18], but also influence QoL more directly.

Despite the previously reported relation between family composition and poor QoL in adults with psychiatric disorders [13], poor QoL was not correlated with family composition, which was operationalized as living in a one-parent family.

Clinical implications

When factors from all levels of our model were entered in one analysis, factors from the child level and the family/social network level explained most additional variance, over and above the variance of child psychopathology, and factors from the parent level explained hardly any additional variance. In other words, statistically, child and family/social network factors seem more important than parent factors. These results may lead to two conclusions.

First, it may be concluded that to improve children's QoL, child and family/social network factors should, besides child psychopathology, be an important additional focus of treatment programs, especially on enhancing self-esteem and social skills, and on improving family functioning and strengthening social support. Additionally, comorbid chronic physical diseases should be treated adequately and stressful life events should be prevented. Finally, our results showed that to focus treatment on parent factors as such seems less important.

The co-occurrence of poor QoL with low self-esteem or poor social skills may be relevant for clinical practice, because clinicians may be in a position to also address these factors, besides the child's psychopathology. In essence, it might be important to focus treatment programs on self-esteem and social skills, too. Some treatment programs for anxiety disorders already contain social skills training (e.g. [51, 52]) or aim at enhancing self-esteem specifically (e.g. [53]), while others do not (e.g. [54, 55]). Our findings do not guarantee that treatment modules aimed at the improvement of social skills or self-esteem will result in better treatment outcome for all patients, since the present study is not a treatment outcome study. However, they suggest that treatment including such targets may add to treatment only targeting psychiatric symptoms.

Findings regarding family functioning indicated that children with a poor QoL were more likely to live in families with poor family functioning; i.e. in families with poor problem solving, ambiguous or masked communication between family members, difficulties to reveal each other's feelings and difficulties to support each other. This may implicate that, to improve children's QoL, it might be important to focus treatment on improving these aspects of family functioning.

The relation between poor QoL and poor social support may implicate that children with a poor social network experience a worse QoL. It can be hypothesized that treatment that focuses on social support might help to improve treatment outcome. Some treatment programs already teach children skills for improvement of social support (e.g. [53, 56]), but in the future it seems worthwhile to study if addition of therapy modules aimed at improving the capacity of the child to enhance social support, will improve the child's QoL.

A second conclusion from the findings of this study, concerns the analyses with parent factors only, in which associations were found between QoL and parent factors. These associations became non-significant in the multiple regression analyses. Apparently, parent-related factors do not account for differences in QoL, once functioning of the family as a whole is accounted for. These parent factors might be associated with child or family/social network factors and be related to QoL through their association with child or family/social network factors. Otherwise parent factors would have been independent predictors of QoL in the multiple regression analyses.

Informant issues

In the present study, data on the child's QoL and the different child, parent, and family/social network characteristics were derived from four different types of informants: children themselves, parents, teachers, and clinicians. In the previous section, we generalized our findings and did not focus on differences and similarities between informants in variables associated with QoL. Several associations were found across QoL raters, which enhances the generalization of findings. The association between QoL and child psychopathology was found for all raters. Overall, factors that were related to QoL ratings of parents and clinicians showed high resemblance. On the other hand, factors associated with QoL ratings of

children differed from those associated with QoL ratings of parents and clinicians. Factors related to the QoL judgement of parents and clinicians seemed to concern observable factors, like social skills of the child. Factors correlated with the child's QoL judgement seemed to represent the inner world of the child, like self-esteem and experienced social support.

In parent report on QoL, most variance in QoL was explained by child psychopathology and the other predictors added little variance to the model. In child and clinician QoL report, the other factors added more variance to the models.

Our findings emphasize the importance of the use of multiple informants in QoL measurement, as is suggested by others [57]. From the results of the present study, it may be hypothesized that parents and clinicians might be better informants regarding factors concerning observable characteristics of the child and parents, while children might be better informants on factors representing the child's inner world. It should be noted, however, that the information on the different factors was not obtained from all informants. Children, for instance did not fill in questionnaires concerning family functioning or social skills.

Limitations

A first possible limitation of the present study is the lack of child self-report regarding psychopathology and social skills. Poor QoL co-occurred with teacher and parent reports on the child's psychopathology and poor social skills. The absence of child self-report on psychopathology and social skills may have influenced the results, because, for instance, children themselves often disagree with parents and teachers with respect to the presence of psychopathology (e.g. [58]). Based on child information, different associations between QoL and psychopathology might have been found, because it may be possible that children with internalizing problems, for instance, suffer more from their problems than parents and teachers may expect. In these children, QoL might be associated more with self-reported symptoms, than with symptoms reported by parents or teachers. In the present study, psychopathology and social skills were not assessed via self-reports, because the majority of the participants were too young to fill in questionnaires regarding psychopathology and social skills.

The cross-sectional design of this study is a second limitation. This may limit conclusions regarding the direction of relations between QoL and each of the variables, because it is difficult to determine if QoL is influenced by a variable or vice versa. However, several factors tended to coincide with poor QoL, and therefore it can be hypothesized that treatment that focuses on these factors might help to improve treatment outcome. Longitudinal studies are needed to decide more precisely which factors are related to QoL and should be a focus of treatment programs.

A third limitation may be the present sample being a clinic sample. This is on one hand very strong, because it indicates that the findings of this study are representative and useful for clinical practice, but it cannot be assumed that the findings of the present study reflect the situation in the general population.

Conclusion

Clinicians probably aim to improve a child's QoL by treating psychiatric symptoms. In this study, indeed, poor QoL was associated with psychiatric symptoms, so, to increase a child's QoL treating these symptoms is important. Besides, poor QoL was associated with low self-esteem, poor social skills, chronic physical disease, parenting stress, poor family functioning, poor social support, and stressful life events. In multiple linear regression analyses, parent factors added little variance to the models. From this it may be concluded that to improve a child's QoL, treatment programs should at least focus on diminishing the child's psychiatric symptoms, enhancing self-esteem and social skills, and on improving family functioning and strengthen social support. Aiming treatment at these factors may especially be important, because treatment programs aimed at symptoms are not always successful. In this way, treatment outcome might be improved.

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