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Agreement of child and parent-proxy reported health-related quality of life in children with mental disorder

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Abstract

Purpose The purpose of the study was to test whether elevated levels of depressive and anxiety symptoms affect parent-proxy reports of health-related quality of life (HRQL) of children with mental disorder.

Methods A sample of 114 children, who screened positive for mental disorder using the Mini International Neuropsychiatric Interview were studied. Parents' depressive symptoms were measured using the Center for Epidemiological Studies Depression Scale (CES-D) and anxiety symptoms using the State Trait Anxiety Inventory (STAI). To examine whether parental psychopathology moderated their reports of child HRQL (using the KIDSCREEN-27), a series of multiple regression analyses with product-term interactions were conducted.

Results Significant interactions were found for the moderating effect of parental depressive [$\beta = 0.025\ (0.007, 0.042)$] and anxiety symptoms [$\beta = 0.033\ (0.011, 0.054)$] on the domain of child social support and peers relations, as well as for the moderating effect of parental levels of depression on parent proxy child physical well-being [$\beta = -0.017\ (-0.031, -0.003)$]. Parents with elevated levels of depressive or anxiety symptoms reported lower scores for those domains of child HRQL.

Conclusions Symptoms of depression and anxiety in parents influence their reports of the HRQL of their children with mental disorder, particularly in the areas of physical well-being and social support and peers. Given the importance of patient-reported outcomes in the assessment and monitoring of children with chronic conditions, including HRQL, health professionals caring for children with mental disorder should be aware of how parental psychopathology contributes to informant bias. Future research examining why psychopathology influences parental reports of child HRQL is warranted.

Keywords Anxiety · Depression · Informant bias · Mental disorder · Proxy report

Introduction

Research has shown informant discrepancies in health outcome reporting between children with behavioral problems and their parents [1, 2]. Informant discrepancies in clinical settings are problematic, potentially interfering with treatment decision-making [3, 4]. The tendency for parent reports of their child's well-being to differ from that of the child's own report is affected by individual, family, and system characteristics [3]. At the individual level, elevated levels of parental depression or anxiety have been found to distort reports of children's externalizing behavior problems [5]

such that parents, most often mothers, experiencing elevated levels of depression or anxiety [6] report increased behavior problems in children compared to other informants (e.g., children, teachers). This type of informant bias is typically referred to as depression or anxiety distortion [1, 5–7]. The presence of mental disorder in children may also influence reports of their own health-related quality of life (HRQL). Previous research shows that children with symptoms of depression report poorer HRQL across the domains of physical and psychological well-being, moods and emotions, and self-perception [8]. They also report increased difficulties with participating in tasks independently and engaging in parent, peer, and school activities in comparison to their healthy counterparts [8].

In the context of mental health, there is currently a paucity of information about parental depression or anxiety distortion on reports of HRQL in children with mental disorder. However, there is some evidence of disagreement

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between parents and children with mental disorder on outcomes related to HRQL and behavioral symptoms [9]. One study showed moderate levels of agreement across all HRQL domains among parents and their children with attention-deficit hyperactivity disorder [intraclass correlation (ICC) range 0.66–0.75] [10]. Another study demonstrated a low to moderate level of agreement between healthy parents and their children [11]. Physical well-being had the highest agreement at baseline (ICC = 0.59) in comparison to less observable dimensions like psychological well-being (ICC = 0.46) [11].

There are however only a few studies in clinical populations of children with chronic health conditions that directly compare parent-proxy and child-reported HRQL [12–16]. One study examined depression distortion on maternal reports of HRQL in children with epilepsy and showed no evidence of distortion when comparing maternal versus clinician reports [12]. Another study also found no evidence of distortion between mothers with a history of depression and their healthy children [17]. In fact, the study found that the level of agreement across all HRQL domains was moderate (e.g., ICC = 0.51). However, there was poor agreement in the domains of autonomy and parent relations and peers and social support [17].

Potential reasons for disagreement in HRQL reporting between parents and their children include differences in perspectives on evaluating HRQL, as well as the possibility for children to minimize (i.e., under-report) negative symptoms of HRQL [18, 19]. Although a systematic review has been conducted examining parental disagreement in reporting children's HRQL [20], the extent to which this distortion may be affected by parental levels of depression or anxiety is presently unknown. Therefore, the aim of this study is to examine the extent to which levels of depression and anxiety among parents influence agreement between parent-proxy and children's self-reported HRQL in children with mental disorder. We hypothesized that parents with elevated levels of depression or anxiety will consistently under-report their child's HRQL and that levels of parental depression and anxiety would moderate the level of agreement between parent-proxy and child-reported HRQL.

Methods

Sample and procedure

Families (child and one parent) were recruited from physical (endocrinology, neurology, respirology, rheumatology) and mental health clinics within a pediatric hospital in Canada and consisted of English-speaking families with a child aged 4–17 years of age who screened positive for mental disorder according to the Mini International

Neuropsychiatric Interview (MINI-KID). Families were invited by physicians or clinic nurses to speak to research staff about the study at the end of their medical appointment. Research staff confirmed the language and age-eligibility of families, provided them with a study information letter, described the objectives of the study, and what participation would entail. Interested families were then contacted by the study coordinator to complete the MINI-KID via telephone or in-person at their convenience. The study coordinator had a Master's degree in child and youth studies and underwent training that included monitored practice under supervision of the principal investigator. Those who screened positive for mental disorder were then scheduled to complete the in-person interview at the hospital or research office. Informed consent was obtained from all individual participants included in the study. Ethical approval for the study was obtained from the institutional research ethics board. Of the 321 families approached to participate, 200 (62%) provided consent, 150 (47%) completed the telephone interview, and 114 (36%) children screened positive for mental disorder and were included in the analyses.

Measures

Parental levels of depression and anxiety

The Center for Epidemiological Studies Depression Scale quantified levels of depression in parents (CES-D) [21]. The 20-item scale includes items that assess levels of depressed affect, positive affect, somatic activity, sleep, and interpersonal relations in adult populations over the past week. A four-point Likert scale (0–3) is used with anchor points for symptom frequency from "rarely or none of the time (< 1 day)" to "most or all of the time (5–7 days)." The score ranges from 0 to 60, with higher scores indicating greater impairment. Individuals scoring ≥ 16 are typically identified as having clinically relevant levels of depression [21, 22]. The CES-D has been extensively validated [23, 24] and the internal consistency in this study was $\alpha = 0.86$.

Levels of anxiety in parents were measured using the 20 items related to "trait anxiety" from the State Trait Anxiety Inventory (STAI), which provides an assessment of how adults generally feel, as well as their propensity for perceived anxiety [25]. Responses were scored from '1' (almost never) to '4' (almost always) and summed to a total score of 20–80, with higher scores indicating higher levels of anxiety. A cut point of 39 has been recommended to detect clinically significant levels of anxiety [26]. The STAI has robust psychometric properties [24, 25]. In this study, internal consistency for the STAI was $\alpha = 0.79$.

Child health-related quality of life

Health-related quality of life of children was measured using the KIDSCREEN-27 [27], a 27-item measure for children and parents assessing five domains: physical well-being, psychological well-being, autonomy and parental relations, social support and peers, and school environment. Responses are scored using a five-point Likert scale and domain scores are transformed into T-values with a mean of 50 and a standard deviation of 10. Higher scores indicate better HRQL. The KIDSCREEN-27 has been found to be valid and reliable in children with and without chronic health conditions [27, 28] and demonstrates adequate agreement between informants [29]. Internal consistency reliabilities for each domain from this study ranged from $\alpha = 0.67–0.88$.

Child Mental Disorder

Mental disorder in children was measured using the MINI-KID [30]. The MINI-KID is a structured diagnostic interview used to screen children aged < 18 years for mental disorders according to the Diagnostic and Statistical Manual of Mental Disorders-IV and International Classifications of Diseases 10. It has been validated against the Schedule for Affective Disorders and Schizophrenia for School Aged Children-Present and Lifetime Version [30]. It is composed of diagnostic modules that contain screening questions for each disorder assessed. For this study, the presence of the most common mental disorders was included: major depressive episode, separation anxiety disorder, social phobia, specific phobia, generalized anxiety disorder (classified as internalizing disorders), attention-deficit/hyperactivity disorder, oppositional defiant disorder, and conduct disorder (classified as externalizing disorders) [31]. The MINI-KID has demonstrated strong psychometric properties [32, 33].

Sociodemographic characteristics

Information was collected from parents on their and their child's age, sex, and immigrant status. In addition, parents' marital status was coded as being in a relationship (married or common-law) or not, parents' education as having completed postsecondary education or not, and household income in $15,000 increments from < $15,000 to ≥ $165,000. Household income was dichotomized as below or above $75,000, the median household income in Ontario, the province in which our study was conducted [34].

Statistical analysis

Unadjusted comparisons between parents' and children's reports on the KIDSCREEN-27 domains were made by computing standardized effect sizes (d) and their associated 95% confidence intervals (CI). An effect size of $d = 0.2$ is considered small, 0.5 medium, and 0.8 large [35]. Intraclass correlation quantified the agreement between parent proxy and child-reported HRQL. An ICC of ≤ 40 was designated as poor to fair agreement, 0.41–0.60 moderate, 0.61–0.80 good, and 0.81–1.00 as excellent [10]. Regression models were computed to examine whether parental levels of depression and anxiety influenced parents' reports of their children's HRQL [12, 36]. Modeled separately for parents' levels of depression and anxiety, each of the five domains of the parent-proxy KIDSCREEN-27 were regressed on children's reported KIDSCREEN-27 domain score, parents' levels of depression and anxiety (CES-D or STAI), and a product-term interaction between children's reported KIDSCREEN-27 and parents' levels of depression and anxiety. The interaction term estimates the extent to which the association between children's and parents' reports on the KIDSCREEN-27 is moderated by levels of depression or anxiety in parents. In the presence of a statistically significant interaction, a post hoc regression model that included a moderator variable conditioned its standard deviation was computed to further describe the effect of parents' levels of depression or anxiety on reports of children's HRQL [37]. The regression models adjusted for the potentially confounding effects of child's and parent's age and sex, child's mental disorder (internalizing or externalizing), parent's immigrant and marital status, and annual household income. Hypothesis tests were two-sided with $\alpha = 0.05$. Data were analyzed using SPSS 21.

Results

Sample characteristics

Characteristics of the study sample are shown in Table 1. Briefly, children had a mean age of 14.3 (SD 2.2) years and 67% were female. Phobia (social or specific) was the most common internalizing disorder affecting 78% of children, whereas oppositional defiant disorder was the most common externalizing disorder affecting 52% of children. The mean age of parents was 46.0 (SD 6.2) years and 85% were female. The majority of parents (61%) were in a relationship and 68% completed postsecondary education. Parents had a mean CES-D score of 19.8 (10.5), ranging from 0 to 46 and a mean STAI score of 43.8 (8.1), ranging from 25 to 65.

Comparison of HRQL reports

Overall, parents reported lower scores compared to children across all domains of HRQL measured by the KID-SCREEN-27 (Table 2). These differences were statistically significant for psychological well-being [$d = 1.09$ (0.75,

Table 1 Characteristics of study sample

Characteristic	n (%)
Child	
Age (years), mean (SD)	14.3 (2.2)
8–11 years	10 (9.4)
12–14 years	38 (35.5)
15–17 years	59 (55.1)
Female	76 (66.7)
Immigrant	5 (4.4)
Mental disorder	
Major depressive episode	86 (75.4)
Separation anxiety disorder	48 (42.1)
Phobia	89 (78.1)
Generalized anxiety disorder	87 (76.3)
Adjustment disorder	104 (91.2)
Attention-deficit hyperactivity disorder	52 (45.6)
Oppositional defiant disorder	59 (51.8)
Conduct disorder	29 (25.4)
Parent	
Age (years), mean (SD)	46.0 (6.2)
Female	97 (85.1)
Immigrant	17 (14.9)
Married or common-law	69 (60.6)
Postsecondary school graduate	77 (67.5)
Annual household income ≥ $75,000	62 (54.4)
Levels of depression (CES-D), mean (SD)	19.8 (10.5)
Low (< 16)	37 (33.6)
High (≥ 16)	73 (66.4)
Levels of anxiety (STAI), mean (SD)	43.8 (8.1)
Low (< 39)	25 (22.7)
High (≥ 39)	85 (77.3)

1.23)], social support and peers [$d = 0.43$ (0.18, 0.63)], and school environment [$d = 0.35$ (0.11, 0.55)] for parents with CES-D scores ≥ 16. These differences were also statistically significant for psychological well-being [$d = 0.97$ (0.69, 1.18)] social support and peers [$d = 0.40$ (0.17, 0.58)], and school environment [$d = 0.29$ (0.07, 0.47)] for parents with STAI scores ≥ 39. Differences were statistically significant for psychological well-being for parents with scores below the threshold for depression [$d = 0.75$ (0.40, 1.10)] and social support and peers [$d = 0.34$ (0.02, 0.72)]. There was also a statistically significant difference for psychological well-being [$d = 0.80$ (0.34, 1.12)] for parents with scores below the threshold for anxiety.

Informant agreement KIDSCREEN-27

Table 3 shows the magnitudes of agreement between parents and children on each domain of the KIDSCREEN-27. Agreement between children and healthy parents was good

for physical well-being [ICC = 0.79 (0.57, 0.92)] and school environment [ICC = 0.63 (0.47, 0.77)] but moderate agreement for the remaining domains. There was good agreement for physical well-being [ICC = 0.64 (0.49, 0.76)], social support and peers [ICC = 0.71 (0.64, 0.78)], and school environment [ICC = 0.74 (0.67, 0.80)] between children and parents above the threshold for depression. There was also good agreement for physical well-being [ICC = 0.66 (0.53, 0.77)], but poor agreement for psychological well-being [ICC = 0.26 (0.11, 0.50)] between children and parents above the threshold for anxiety.

Effect of parental levels of depression

Table 4 shows the results of the regression models examining the moderating effect of parental levels of depression on reports of their child's HRQL. Two significant product-term interactions were found for physical well-being ($\beta = -0.017$, $p = 0.020$) and social support and peers ($\beta = 0.025$, $p = 0.006$). Post hoc analyses suggested that in the presence versus absence of elevated levels of depression, parents over-reported physical well-being among children who self-reported high HRQL in this domain (Fig. 1). In contrast, parents with elevated levels of depression over-reported HRQL among children who self-reported low social support and peers scores, but under-reported among children who report high HRQL in this domain (Fig. 2).

Effect of parental levels of anxiety

Table 5 shows the results of the regression models examining the moderating effect of parental levels of anxiety on reports of their child's HRQL. One significant product-term interaction was found indicating that parental levels of anxiety moderated the effect on reports of child's social support and peers ($\beta = 0.033$, $p = 0.003$). Post hoc analysis echoed the results of parental levels of depression on their child's social support and peers—parents with elevated levels of anxiety over-reported HRQL among children who self-reported low social support and peers scores, but under-reported among children who reported high HRQL in this domain (Fig. 3).

Discussion

The aim of this study was to investigate whether levels of depression or anxiety in parents affected their reports of the HRQL in their children with mental disorder. Parents typically reported lower HRQL for their children compared to the children's own self-report, particularly in the domains of psychological well-being, social support and peers, and school environment, a finding consistent across

Table 2 Comparison of parent's and child's reports of health-related quality of life

KIDSCREEN-27 domain	Parent-report	Child-report	d (95% CI)
Full sample			
Physical well-being	37.8 (8.7)	39.0 (8.6)	0.18 (− 0.29, 0.01)
Psychological well-being	31.9 (7.5)	38.3 (7.1)	0.93 (0.67, 1.08)
Parents and autonomy	43.5 (9.0)	44.3 (9.2)	0.08 (− 0.30, 0.12)
Social support and peers	39.2 (11.1)	43.8 (12.3)	0.39 (0.20, 0.59)
School environment	39.7 (10.7)	42.7 (11.4)	0.29 (0.09, 0.45)
CES-D < 16			
Physical well-being	39.2 (8.5)	40.6 (7.3)	0.25 (− 0.40, 0.04)
Psychological well-being	33.7 (7.8)	39.7 (8.1)	0.75 (0.40, 1.10)
Parents and autonomy	45.2 (7.4)	47.7 (10.6)	0.24 (− 0.63, 0.09)
Social support and peers	41.4 (10.6)	45.9 (13.4)	0.34 (0.02, 0.72)
School environment	43.4 (10.6)	45.2 (12.0)	0.16 (− 0.47, 0.15)
CES-D ≥ 16			
Physical well-being	37.0 (8.8)	38.3 (9.1)	0.17 (− 0.34, 0.05)
Psychological well-being	30.9 (7.1)	37.8 (6.5)	1.09 (0.75, 1.23)
Parents and autonomy	42.6 (9.6)	42.9 (8.2)	0.03 (− 0.30, 0.23)
Social support and peers	38.5 (11.3)	43.2 (11.9)	0.43 (0.18, 0.63)
School environment	38.2 (10.5)	41.7 (10.9)	0.35 (0.11, 0.55)
STAI < 39			
Physical well-being	38.2 (9.9)	40.3 (8.0)	0.33 (− 0.51, 0.04)
Psychological well-being	32.9 (8.0)	38.9 (8.3)	0.80 (0.34, 1.12)
Parents and autonomy	46.7 (9.8)	47.3 (10.3)	0.05 (− 0.55, 0.43)
Social support and peers	40.4 (10.2)	44.1 (14.7)	0.24 (− 0.74, 0.16)
School environment	42.7 (10.8)	44.6 (9.9)	0.18 (− 0.57, 0.21)
STAI ≥ 39			
Physical well-being	37.6 (8.4)	38.6 (8.8)	0.14 (− 0.29, 0.06)
Psychological well-being	31.6 (7.2)	38.0 (6.5)	0.97 (0.69, 1.18)
Parents and autonomy	42.5 (8.5)	43.4 (8.8)	0.09 (− 0.33, 0.13)
Social support and peers	39.2 (11.5)	43.5 (11.3)	0.40 (0.17, 0.58)
School environment	39.1 (10.6)	42.1 (11.7)	0.29 (0.07, 0.47)

Table 3 Parent and child agreement on the KIDSCREEN-27

	Healthy parents	Parents CES-D ≥ 16	Parents STAI ≥ 39
Physical well-being	0.79 (0.57, 0.92)	0.64 (0.49, 0.76)	0.66 (0.53, 0.77)
Psychological well-being	0.58 (0.36, 0.77)	0.51 (0.40, 0.63)	0.26 (0.11, 0.50)
Parents and autonomy	0.51 (0.33, 0.70)	0.60 (0.51, 0.69)	0.40 (0.24, 0.58)
Social support and peers	0.48 (0.31, 0.65)	0.71 (0.64, 0.78)	0.50 (0.34, 0.65)
School environment	0.63 (0.47, 0.77)	0.74 (0.67, 0.80)	0.52 (0.37, 0.67)

Results are the intraclass correlation coefficients and associated 95% confidence intervals

subgroups stratified by level of parental depression or anxiety. With regard to parent–child agreement in children with mental disorder, data are sparse. Our findings of good agreement for physical well-being and moderate agreement for social support and peers align with those reported in a population sample of healthy parents and children with ADHD [10]. Findings in other HRQL domains were less comparable, perhaps attributable to sample differences (population versus clinical) between studies. Our sample

size did not permit for the examination of agreement by child mental disorder.

Findings also showed that levels of parental depression and anxiety augmented agreement between parent-proxy and child-reported HRQL in the domains of physical well-being and social support and peers. When children report higher physical well-being, parents with greater levels of depression over-estimate children's physical well-being. This parental informant bias may be explained by parents

Table 4 Tests of moderation examining the presence of depression distortion

KIDSCREEN-27 domain	Model F	Model R^2	Interaction B	95% CI
Physical well-being	9.96	0.57	− 0.017	− 0.031, − 0.003
Psychological well-being	6.49	0.47	− 0.007	− 0.026, 0.011
Parents and autonomy	2.58	0.25	0.003	− 0.013, 0.020
Social support and peers	4.71	0.38	0.025	0.007, 0.042
School environment	7.30	0.49	− 0.002	− 0.900, 0.918

Regression models adjusted for the potential confounding effects of child and parent age and sex, child mental disorder (internalizing or externalizing), parent immigrant and marital status, and annual household income. All models had 12 degrees of freedom and were statistically significant at $p \leq 0.005$
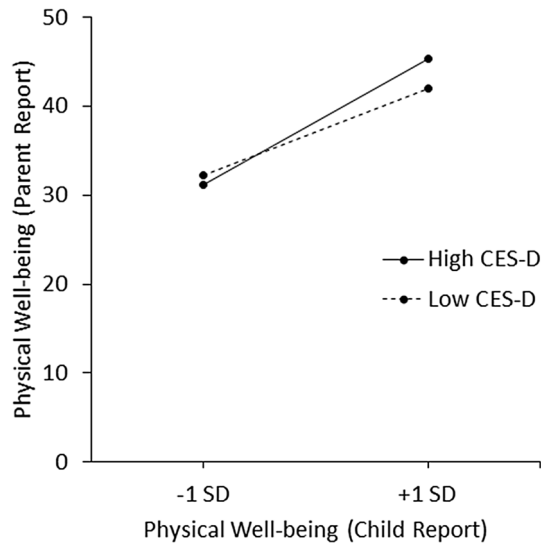
Fig. 1 Effects of parental depressive symptoms on reporting physical well-being in children
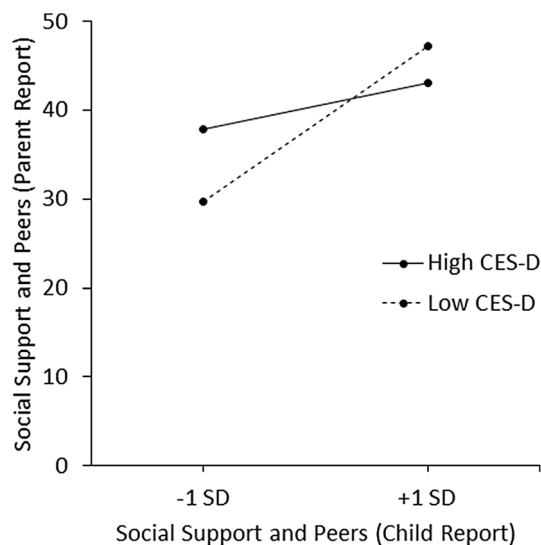
Fig. 2 Effects of parental depressive symptoms on reporting social support and peer relations in children

with elevated levels of depression having different perspectives of their child's health concerns [38]. In other words, it is possible for parents with elevated levels of depression to focus more on psychological and social issues and see physical problems as less of a concern, which may consequently lead them to over-report physical well-being [38]. Moreover, parents with elevated levels of depression and anxiety may be less physically active themselves [39, 40] so they may interpret their child as being physically active/ well when they observe them engaging in physical activities. Relative to caring for a child with mental disorder, parents may perceive physical health problems as having less impact on family life [41], thus supporting the fact that parents in this context reported higher physical well-being than children with mental disorder.

Additionally, parents may be more familiar with reporting physical well-being because changes in physical health are increasingly visible and its mechanisms are easier to understand in comparison to mental health [41]. This increases the likelihood of parents to over-report physical well-being in their children. There is also the possibility of bias in children's physical well-being reports. This bias could be due to children with mental disorder having poor overall self-esteem [42], specifically low physical self-esteem [43]. Thus, children with mental disorder may under-report physical well-being because they have poor perceptions of their own physical health. They may feel that their mental disorder is preventing them from feeling fit and physically competent [44]. Overall, the presence of disagreement in physical well-being reports may be a function of both parental and child mental health.

Differences in the reporting of social support and peers may be explained by a few factors. First, when children report low support, parents with elevated levels of depression or anxiety may over-report child's social support and peers because they have social support problems themselves [45, 46]. For example, mothers with social anxiety may perceive their child to be overly socially active, if the child has several friendships and they have fewer. This distortion could lead to an over-report in this domain.

Table 5 Test of moderation examining the presence of anxiety distortion

KIDSCREEN-27 domain	Model F	Model R^2	Interaction B	95% CI
Physical well-being	9.43	0.55	− 0.017	− 0.037, 0.002
Psychological well-being	5.88	0.43	− 0.008	− 0.027, 0.011
Parents and autonomy	2.74	0.24	0.003	− 0.019, 0.024
Social support and peers	4.98	0.39	0.033	0.011, 0.054
School environment	7.83	0.51	− 0.016	− 0.037, 0.004

Regression models adjusted for the potential confounding effects of child and parent age and sex, child mental disorder (internalizing or externalizing), parent immigrant and marital status, and annual household income. All models had 12 degrees of freedom and were statistically significant at $p \leq 0.008$
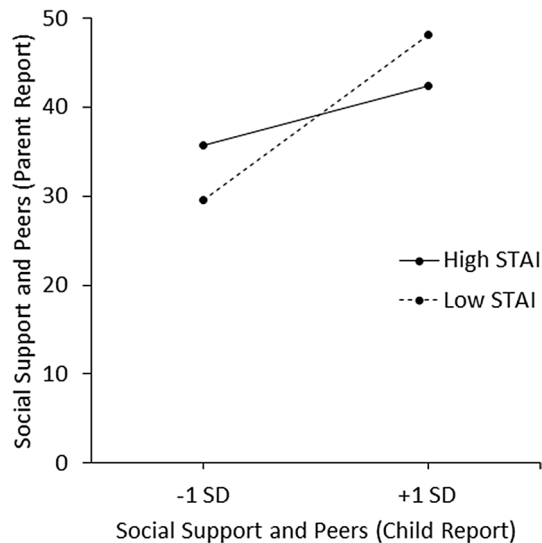
Fig. 3 Effects of parental anxiety symptoms on reporting social support and peer relations in children

Furthermore, depressed parents usually withdraw from friendships [45] and may consequently feel that, relatively, their child is socially involved. Conversely, parents with elevated levels of depression or anxiety have diminished reports of their children's HRQL, when children report good support. Essentially, parents with elevated levels of depression or anxiety may negatively bias their recall of their child's HRQL to be more consistent with their mood [6, 36]. Therefore, this distorted perception of a child's social support may be due to parents projecting their social problems onto their child [47] and thus perceiving their child's social support and peer connections to be worse than they truly are. In addition, the presence of internalizing symptoms in children could lead to differential reporting in social support and peers [48]. Children with internalizing disorders such as major depressive disorder are more likely to report poor HRQL in social and peer activities [49]. It is therefore possible that the presence of internalizing symptoms in children in this sample could have distorted children's own reports of social support.

This study only found a presence of distortion on physical well-being and social support and peers. Given the relatively small sample size of this study, there may have been limited power to detect other effects of moderation on children's reports of HRQL. Moreover, because this is the first study to examine moderating effects of levels of depression and anxiety in parents and children with mental disorder, replication in other samples is needed to determine if the absence of moderation in other domains is a robust finding.

There are three limitations related to this study. First, the sample was recruited from a paediatric hospital that may not be representative of all families of children with mental disorder, particularly with regard to the severity of parental levels of depression and anxiety. In addition, the sample had an under-representation of immigrant families, perhaps a consequence of the healthy immigrant effect [50]. Second, due to a lack of fathers in the study, an investigation as to whether the influence of parental levels of depression and anxiety on reports of children's HRQL was different for mothers and fathers could not be examined. However, evidence has suggested that the experience of depression and anxiety symptoms and stress is similar for mothers and fathers when taking the primary caregiving role for children with chronic health conditions [51, 52]. Instead, we adjusted for parent's sex in our models to generate unbiased estimates of moderation. Third, there are limitations associated with the measures used in the study. The CES-D and STAI are self-reported screening measures of psychological distress rather than diagnostic instruments for clinical depression and anxiety. However, these measures have consistently demonstrated robust psychometric properties [22, 24] when applied in multiple research contexts [53–55].

Conclusion

Levels of depression and anxiety in parents influence their reports of HRQL in their children with mental disorder, particularly with regard to physical well-being and social support and peers. Accurate reports are needed to understand treatment outcomes in child mental disorder. Health

professionals should consider the mental health of parents within a family-centerd care approach [56] when collecting parent-reported information on children's HRQL and be aware of the potential direction of bias when interpreting parent and child-reported outcomes, particularly as it relates to treatment effects over the long term. Future research examining why levels of depression or anxiety influence parental reports of their child's HRQL is necessary in order to promote effective treatment decision-making. By asking parents about their own mental health, health professionals will be better able to assess their children's HRQL and subsequently tailor appropriate mental health treatment(s).

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from each participant included in the study.

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