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Could we use parent report as a valid proxy of child report on anxiety, depression, and distress? A systematic investigation of father-mother-child triads in children successfully treated for leukemia.

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Abbreviation table:

Abbreviation	Full term
ICC	Intraclass correlation coefficients
ALL	Acute lymphoblastic leukemia
DFCI	Dana Farber Cancer Institute
SJUHC	Sainte-Justine University Health Center
BYI	Beck Youth Inventories
DRS	Distress Rating Scale
DT	Distress Thermometer
BSI-18	Brief Symptom Inventory-18

Abstract

Background: Systematic assessment of emotional distress is recommended in after care. Yet, it is unclear if parent report may be used as a proxy of child report. The aim of this study was to assess agreements and differences and explore possible moderators of disagreement between child and parent ratings. **Methods:** Sixty-two young survivors treated for Acute Lymphoblastic Leukemia (9-18 years) and both parents responded to the Beck Youth Inventory (anxiety and depression) and the Distress Rating Scale on the child's status. Parents completed the Brief Symptom Inventory-18 on their own psychological status. Systematic analyses of agreement and differences were performed. **Results**: Mother-child and father-child agreements were fair on anxiety, depression, and distress (median ICC=0.37). Differences between parents and children were medium sized (median d=0.55) with parents giving higher scores than their children on anxiety, depression and distress. Mothers reported distress more frequently than fathers (39 vs 17%) when children reported none. The child being a girl and lower parental income were associated with lower agreement in fathers when rating child distress. Higher levels of parental psychological symptoms were consistently associated with lower agreement. **Conclusions:** Parent-child differences when rating adolescent survivors' difficulties may be more important than previously thought. Parent report probably cannot be considered as a valid proxy of older child report on such internalized domains as anxiety, depression, or distress in the after-care clinic. Parents' report is also likely to be influenced by their own mood, a factor that should be corrected for when using their report.

Background

Recent standardized guidelines of care for pediatric cancer survivors have highlighted a high quality of evidence on heightened distress, anxiety and depression in this population and formulated strong-level recommendations for systematic psychosocial screening[1]. Thorough follow-ups and yearly psychosocial screening are recommended[1-4]. Psychosocial assessment is essential as it allows for accurate detection of mental health concerns and very probably favors the delivery of targeted care[1-4]. Survivors themselves have considered the evaluation of their psychological well-being as very important[5].

This vulnerable population is characterized by higher levels of internalizing symptoms and lower levels of externalizing symptoms[6]. Research estimated that 13-22% of teenagers who survived childhood cancer self-reported psychological difficulties and that their clinical risk for anxiety and depression was also greater than in the normative population [7-9]. Importantly, cancer related distress is more prevalent in at risk groups such as survivors who are older children or adolescents[10,11]. Regular systematic evaluations may help combat unrecognition and undertreatment of psychological problems in this population[12,13].

Systematic evaluation can be conducted by using both child and parent reports. When the self-report of a young patient is difficult to get or believed to be unreliable, common practice is to rely on other informants' ratings like that of a parent or teacher. Parents, as main caregivers, are in a prime position to observe their children and are likely to be knowledgeable about their experience[14,15]. As a proportion of young survivors may develop neurocognitive difficulties which could imperil the accuracy of self-report, parents' reports may be an essential source of information. In fact, survivors often experience adverse effects resulting in symptoms like fatigue, executive function deficits and concentration difficulties[7,16-18] that can be detrimental for

skills necessary to form an accurate self-judgment or a realistic appraisal of the disease's implications[19,20].

Studies in healthy and clinical populations have found that parents' ratings of children's symptoms and children's self-reported experiences may be discrepant, with greater disagreement being observed for internalizing symptoms[21-25]. Recent studies at various stages of cancer have found low to moderate parent-child agreement on aspects such as self-reported adverse events or health-related quality of life[26-33]. To our knowledge, only three studies have compared parent and child ratings of child distress in the context of pediatric oncology. Two of these examined parents' and children's ratings of child distress on versions of the Distress Thermometer (DT). They both found moderate parent-child agreement at various stages of cancer[34] and in a mixed chronic disease sample (including cancer)[35]. The other compared parents' and children's ratings of child anxiety during cancer treatment on the Pediatric Quality of Life Inventory and reported higher parental ratings[36]. The results of these studies are difficult to interpret as these studies did not provide detailed demographic information on the informants nor the instructions given to parents. They also had somewhat heterogeneous samples.

Previous research suggested that higher agreement levels between parents and children ratings could be associated with a number of factors: a younger child[15], higher parental income, lower maternal anxiety or depression[16-22], or lower repression in children[33]. This is consistent with a meta-analysis which found higher levels of agreement between parents and school-age children in comparison to parents and teenagers on psychological symptoms in a non-clinical sample [21]. Yet, most studies investigating these associations did not partial out the effect of child ratings from the parent ratings to study further moderators. Rare studies had samples of parental raters that include both mothers and fathers[37]. They were also limited as they did not distinguish

between mothers' and fathers' ratings nor did they separately investigate the role of father's and mother's psychological symptoms. No studies have yet examined parents' and children's ratings of child anxiety, depression and distress in young survivors of childhood cancer (<18 years of age). Given that parents differ in their intimacy to children and that those with a child who survived cancer experience significant long-term distress, it is necessary to separately examine parental characteristics that may influence levels of agreement[38-40].

The first objective of the present study was to assess levels of agreement in mother-child and father-child dyads on ratings of child anxiety, depression and distress. Following previous evidence, we expected small to moderate levels of agreement, with Intraclass Correlation Coefficients (ICCs) of 0.30-0.50. The second objective was to evaluate the size of differences in ratings of anxiety, depression and distress between children, mothers and fathers. We expected no more than moderate differences between parents and children ($d < 0.50$) and a tendency for parents to report higher ratings than children. The third objective was to explore associations with disagreements to identify potential moderators. We expected higher child age, lower parental income and elevated levels of parental psychological symptoms to be related with larger disagreements.

Methods

Study participants

Participants were successfully treated for acute lymphoblastic leukemia (ALL) with Dana Farber Cancer Institute (DFCI) protocols at Sainte-Justine University Health Center (SJUHC), PETALE Cohort[41]. They were at least five years post diagnosis, without relapse and no second cancer or stem cell transplant at recall. Two-hundred and fifty-one survivors and their families were contacted, 225 agreed to participate and we obtained full data from 222 survivors (response

rate 88%), 209 mothers (83%), and 174 fathers (69%). To be eligible for the present study, survivors had to be less then 18 years old and still live with their parents. Following those criteria, 88 survivors were eligible for the present study. Only complete mother, father and child triads were retained to enable accurate comparison between dyads. One triad was excluded due to missing data. Our final sample comprised 62 triads and mostly consisted of Caucasians (Table 1). Children's median age was 16 years, mothers' ages ranged from 35-55 years and fathers' age from 38-63 years. Median time since diagnosis was 12 years. All mothers and fathers were biological parents who took care of their child at the time of diagnosis. Differences between participants and non-responders are unknown.

Procedure and data collection

Approval for the protocol was received from the SJUHC Ethics Committee. Participants were contacted by telephone and consent forms were sent to those interested. All parents signed the consent forms for themselves and for their child aged less than 18. Children provided their informed assent. Recruitment was organized at the long-term follow up clinic of SJUHC. During the child's research visit at the clinic, children and parents responded to self-reported questionnaires. If only one parent was present during the visit, he/she would bring the questionnaire in a sealed envelope to be filled by his/her partner at home and send them back to our centre within one week. If a survivor asked for help to complete the questionnaires, a research assistant was available to provide assistance by reading sentences or explaining the meaning of a word. Complete biological measures and a physical health examination were also taken during the child's research visit to the clinic[41]. Participants were compensated to cover expenses for meals and parking. Upon receipt, children's and parents' responses were

screened to identify clinical levels of distress. Positive cases were referred to the psychosocial services of the clinic.

Measures

Child anxiety and depression

Child anxiety and depression were assessed with the Beck Youth Inventories (BYI modules Anxiety and Depression). This self-reported instrument documents psychological status of children and adolescents from 7 to 18 years [42]. In our sample, internal consistency coefficients were .90 for the anxiety module and .89 for the depression module. Raw scores from the 20 likert-type items (0= never, 3=always) were transformed into T-scores for analyses and interpretation. T-scores identify anxiety and depression severity levels: <55 = mild, 55–59 = moderate, 60–69 = severe and >70 = extreme [42].

Child distress

The distress rating scale (DRS) is a single brief visual numeric scale (0= no distress, 10= high distress) measuring distress experienced over the last week[34]. For children at different stages of the cancer continuum, the instrument has shown reasonable convergent validity[34]. Although no cut points have been validated with children yet, a score of 4 may be indicative of significant distress in cancer survivors[43].

Parent report of child anxiety, depression and distress

Independently from their children, parents were asked to provide a proxy assessment of their child's anxiety, depression and distress. In the conceptual literature, two methods have been available to obtain a proxy assessment[15]. Respondents can either be asked to assess a patient by answering based on their own opinion or can be asked to infer the experience of the patient[15]. In the present study, parents were instructed to infer the experience of their child, i.e. to take their perspective while completing analogous versions of the BYI and DRS. Additional instructions

stated: “Answer each question the way you think your child has answered by taking the perspective of your child”. Previous research in oncology and other conditions has shown that such instructions prompted perspective-taking responses on internalized symptoms[44-47]. This was done in order to elicit a substitute judgment from the parent that mirrors the child’s personal impression about their anxiety, depression, and distress. This was preferred here since anxiety, depression, and distress are internalized symptoms, the best source of information lying with the survivor’s experience himself.

Parental psychological symptoms

The Brief Symptom Inventory-18 (BSI-18) evaluated psychological symptoms in parents. The instrument is comprised of three subscales (somatization, depression and anxiety) and a global distress score[48]. It assesses distress experienced in the last week on 18 items scored on 5 points each (0=not at all, 4=extremely)[31]. The BSI-18 is commonly used to indicate distress levels in parents of sick children[39]. The scales showed good internal consistency in our sample (α=0.89-0.93). Raw scores are converted into T-scores for further analyses. A cut-off of 63 on scales is interpreted as a risk to have poor mental health or experience significant distress[48].

Sociodemographic variables

A demographic questionnaire assessed parents’ demographic information to obtain data on sex, age, income, education, marital status, and ethnicity. Clinical history, ALL risk status and treatment information were obtained from the child medical records.

Statistical analyses

All study variables respected criteria for normal distributions[49]. A series of ICCs were computed to evaluate agreement between child and parent report on anxiety, depression and distress. Coefficients <0.40 indicate poor agreement, 0.40-0.59 fair agreement, 0.60-0.74 good

agreement, and ≥0.75 excellent agreement[50]. ICCs could also be compared based on their confidence intervals. We also computed percentage of agreement in parent-child dyads when measures were treated according to cut-points.

Paired t-tests and Cohen's d were computed to assess differences between children's and parents' ratings of child anxiety, depression and distress. Bland-Altman plots evaluated the magnitude of the differences in dyads as a function of the means to explore for systematic patterns. For informative purposes, additional results comparing mothers' and fathers' ratings of child anxiety, depression and distress were also performed (supplementary material online).

We used stepwise multiple regressions to explain disagreements between parents' and children's ratings. Analyses were performed separately for both parents. Using parents' ratings as the dependent variable, children's ratings were entered into the first block so that the second block addressed the residual variance of parental ratings controlling for children's ratings. This residual variance was a measure of disagreement between parents' and children's ratings. The second block included alternatively: 1) child and parent characteristics (child age, child sex, parental income) 2) parental psychological symptoms. We used the SPSS statistics 22 software to conduct all analyses. A value of $p<0.05$ was set for statistical significance.

Results

Parent-child agreement

On average, children reported normative anxiety levels (T=46.87±8.67), with 18% reporting mild to severe levels of anxiety, depression levels (T=45.24±7.03), with 12% reporting mild to severe levels of depression, and distress levels (M=2.40±2.37), with 26% of the children showing 'elevated' levels (Table 2). Parents also reported low global distress on their own status, with only 6% of fathers and 8% of mothers showing significant distress on the BSI-18.

Table 2 presents agreement levels between children and each of their parents. Mother-child agreement ranged from poor to fair (ICC=0.23-0.47) and was lowest on ratings of anxiety. Father-child agreement also ranged from poor to fair (ICC=0.17-0.43). Notably, father-child agreement was not significantly different from zero on distress (ICC=0.17, $p<0.10$). Overall, limited agreement was found between parents' and children's ratings of anxiety, depression and distress. These observations were confirmed when examining parent-child agreement on measures treated with pre-validated cut-points (supplementary Tables S1-2). Interestingly, we found that mothers reported more frequently distress on the DRS than fathers when the child reported none (39 vs 17%) but this was not the case on the more 'objective' measures from the BYI. On all measures, the reports of anxiety, depression and distress by both parents when the child reported these as present were not different than chance (median agreement 52.5%) (Tables S1 and S2).

Parent-child differences

We found medium differences on anxiety (d=0.50) and depression (d=0.66), and small differences on distress (d=0.35) between mothers and children. Similarly, ratings indicated medium differences between fathers and children on anxiety (d=0.60) and depression (d=0.59). Both parents had higher ratings than children on anxiety and depression but only mothers had higher ratings than children on distress (Table 2, Table S2).

Figure 1 illustrates the magnitude of the parent-child differences. No systematic relationships were found between raw differences and levels of anxiety, depression and distress, suggesting that the differences on ratings of anxiety, depression and distress were not influenced by severity. However, when exploring relationships with absolute differences, significant associations revealed that severity on distress was associated with higher differences both in

fathers and mothers (Kendall τs = 0.38 ps<.001), suggesting that differences occur more frequently when distress is higher and in both directions parent>child rating and child>parent rating. Limits of agreement and measurement errors were large which indicated high variability of differences in ratings (supplementary Table S5).

Predictors of parental ratings

When exploring predictors with hierarchical regressions, we found that parental ratings were associated with child sex, parental income and parental psychological status once children's ratings were controlled for (Table 3). A larger residual variance from Block 1, or larger disagreement, was thus associated with the child being a girl and with lower parental income for fathers' ratings of child distress. No effect was associated with child age.

When exploring the role of parents' psychological status, we found that larger disagreements on ratings of child depression were associated with higher levels of maternal anxiety and paternal distress. A larger disagreement on ratings of child anxiety was associated with higher paternal distress. Also, a larger disagreement on ratings of child distress was associated with higher maternal distress (Table 3). Thus, elevated parental psychological symptoms were consistently associated with larger parent-child disagreement. Yet, these predictors only explained a small percentage of the residual variance (ΔR^2=0.10) which suggest that other non-measured factors were involved in disagreement.

Discussion

The current study examined mother, father and self-reports of psychological status in adolescents who have lived most of their lives as childhood cancer survivors. In 62 triads, we found limited mother-child and father-child agreement on anxiety, depression and distress. Medium differences indicated that parental mean ratings were higher on all measures of child

psychological status. An important result was that elevated parental anxiety and distress were associated with larger disagreements for ratings of child anxiety, depression and distress.

The finding that parent-child agreement was low on anxiety, depression and distress is in line with a non-cancer body of literature in the domain of quality of life reporting lower parent-child agreement for children's internalizing problems[51-53]. These observations were also confirmed here when examining positivity according to cut-points. We noticed that fathers as well as mothers had difficulty inferring the levels or presence of anxiety, depression, and distress of children, especially when these were self-reported by children. This is consistent with a body of literature showing that caregivers identify better the absence (ruling out abilities) than the presence (ruling in) of emotional distress in patients[39,44,46]. When no distress was reported by children we found that mothers tended to overestimate distress on the more 'subjective' measure (DRS) and more so than fathers, a result that was not observed on more 'objective' measures (BYI), as on the latter, agreements were similar in both parents. Together, these results suggest that mothers could overestimate distress on measures such as thermometers.

Moreover, we found no agreement between fathers and children for distress. This does not mean that fathers are less sensitive to children psychological status. They may simply have fewer opportunities to observe their children, may be less open than mothers about psychological issues or have wider estimates of normality[54]. Differences between mothers and fathers in regards to agreements with children report further emphasises the necessity of incorporating mothers' as well as fathers' ratings when approaching the psychological status of young survivors.

Our results also show that parents rated higher anxiety, depression and distress for their child than children did to describe their own experience. This observation which could be the

result of an overestimation may be the result of strong beliefs about the impact of cancer. Indeed, parents of ill children have held beliefs that an illness causes more negative consequences on the child's status in comparison to other raters[55]. Another possibility is that survivors underestimated their symptoms and difficulties because they believed those were integral parts of their experience. Survivors' ratings may thus not truly reflect their current reality. For example, previous studies have suggested that they sometimes do not fully comprehend the repercussions of their disease[16,56]. Further, individual differences in psychological functioning such as adaptive style may play a role[33]. Children with low anxiety and high repression have been reported to provide lower ratings than their parents on their psychosocial difficulties during cancer treatment. Finally, as time passes, it is possible that judgments on mental quality of life become more normative as a result of an adaptive process, a phenomenon labeled as *response shift*[57].

Exploring potential predictors of parental ratings, our analyses showed that when fathers provided ratings for a girl, or when fathers had lower income, they were prone to overestimate distress. In a similar way, previous studies have identified associations between child's gender, parental income, and rating discrepancies[58,59]. Of notice, we observed no association between higher child age and larger disagreement as could be expected. Given that most children in our sample were aged between 15-18 years, this may be due to a lack of variability in our sample[60]. We also found that when parents had elevated levels of distress, they tended to overestimate ratings of child anxiety, depression and distress. High distress levels could bias parents' ratings and lead them to overestimate child distress[61]. Parents may recall more negative symptoms or negative experiences about their children more so than the children themselves when answering questions on the child status[62]. This phenomenon is all the more important since systematic

253 reviews have reported high levels of parental distress several years after diagnosis in mothers and
254 fathers of children with cancer[63,64] (although here we found normative distress levels in parents).
255 Notably, the majority of survivors in our study were adolescents aged 15-18 years.
256 Adolescence is a critical developmental period that encompasses emotional, social and
257 behavioral changes intertwined with transitions and increased pressure to be autonomous[6].
258 Adolescents who have survived childhood cancer face the additional burden of uncertainty about
259 the future and the increased dependency on their parents due to neurocognitive and social
260 impairments[65,66]. Consequently, communication between survivors and their parents may
261 become even more disrupted, transform into sources of conflict and put a strain on the parent-
262 adolescent relationship[65,67,68]. In that sense, disagreements observed here may also reflect parent-
263 adolescent relationships[68]. In this adolescent population, accurate evaluation of distress is a
264 major target as teenagers are developing their sense of self and think about their future, the surge
265 of thoughts regarding oneself could enhance the prevalence of internalizing symptoms and
266 comorbidities[6,69,70].
267 This study underlines the necessary use of a multi-informant perspective calling for both
268 parents and the child when young survivors are assessed. This allows to gather different pieces of
269 information to optimise the distress identification in older children[71]. One possible application
270 could be to use either report in the triad as a valid source of information. Potentially, when one
271 report would be elevated, it could trigger a more thorough assessment of the survivor's
272 psychological status. This work also offers evidence that mothers and fathers evaluate their
273 child's distress differently. Therefore, it is important to consider who within the family informs
274 on the child's status when interpreting results. Finally, as parental mood may impact parental
275 report, a strategy could be to incorporate measures of respondents' distress into questionnaires

exploring for child status to control for such factors. This could also serve both purposes of evaluating child and parent status.

Some limitations of our study must be acknowledged. Firstly, our findings are contingent upon the experience of well-adjusted survivors and parents as indicated by low levels of distress in families. Our sample is also very homogeneous in terms of ethnic background as well as clinical history (ALL treated with DFCI protocols). This limits the external validity of our results. Secondly, when exploring moderators of agreement, although we controlled for children's self-reports, the cross-sectional design could not warrant that parental psychological symptoms were a causal factor of disagreements between parent's and children's ratings**.** Thirdly, there was still a large part in disagreement that needed to be explained beyond the factors considered here. Future studies should address other factors that could explain parental ratings of child psychological status. It has recently been suggested that family characteristics, child social desirability and parents' beliefs could influence parental ratings[23] and that a tendency to repress one's feelings could explain underreporting in children[33].

To conclude, we studied parental ratings and self-reports of anxiety, depression and distress in 62 triads of mothers, fathers, and older children successfully treated for childhood cancer. We found low levels of agreement on ratings of child distress and showed that larger disagreements were associated with parental psychological symptoms. This study is original as it includes two rarely studied populations, namely older children and adolescents previously treated for pediatric cancer and their fathers. It also notably extends knowledge on distress in pediatric oncology by exploring potential predictors of parental ratings. Future studies should recognize that each rater contributes to our understanding of children distress and extend the exploration of

the predictors of parent-child agreement as valid multi-informant assessments of emotional distress are timely in after-care.

Conflict of Interest

The authors report no conflicting interests.

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Legend

Figure

FIGURE 1 Bland-Altman plots for anxiety, depression and distress comparing children's ratings with their mothers' or father's ratings

Tables

TABLE 1 Sample description (n=62 mother-father-child triads)

TABLE 2 Agreement on child anxiety, depression and distress in 62 mother-father-child triads of children treated for acute lymphoblastic leukemia

TABLE 3 Hierarchical regressions predicting mother and father ratings on children's anxiety, depression and distress

Supplementary file

SUPPLEMENTARY TABLE S1 Agreement between ratings of parent and children on anxiety and depression

SUPPLEMENTARY TABLE S2 Agreement between ratings of parent and children on distress

SUPPLEMENTARY TABLE S3 Agreement between ratings of mothers and fathers on children's anxiety and depression

SUPPLEMENTARY TABLE S4 Agreement between ratings of mothers and fathers on children's distress

SUPPLEMENTARY TABLE S5 Repeatability analysis applied to mother-father differences on ratings of anxiety, depression, and distress of the child

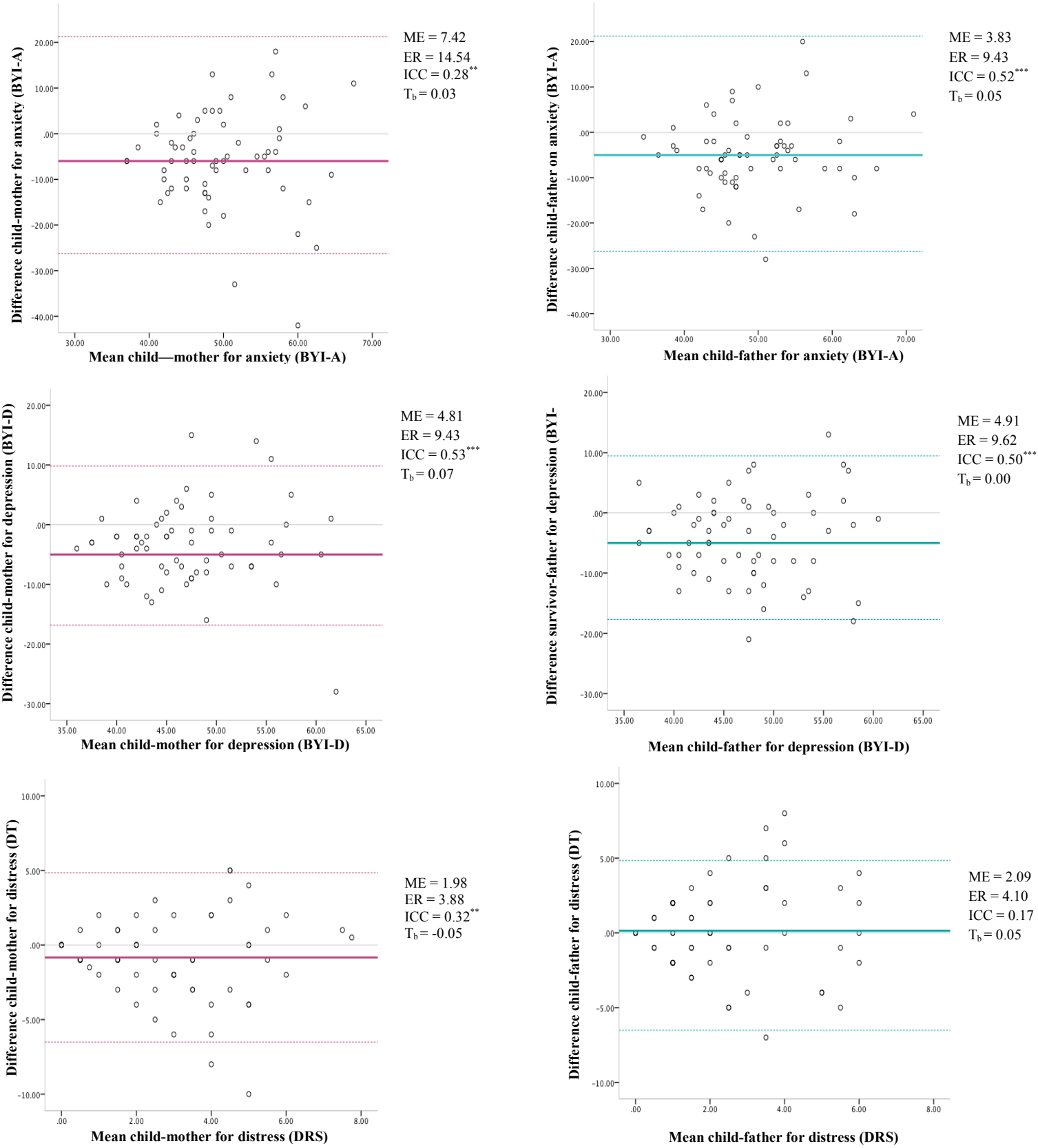
TABLE 1 Sample description (n=62 mother-father-child triads)

Children's characteristics	**M (SD) or *N* (%)**	
Age at diagnosis	3.56 (2.19)	
Age at time of study	15.82 (1.92)	
9-12	4	
13-18	58	
Time since diagnosis	11.55 (2.51)	
Sex of child		
Girls	29 (47)	
Boys	33 (53)	
ALL risk status		
Standard risk	34 (55)	
High risk	28 (45)	
Treatment protocol		
DFCI 95-01	16 (26)	
DFCI 00-01	36 (58)	
DFCI 05-01	10 (16)	
Radiation therapy		
No radiation	38 (61)	
Radiation	24 (39)	
Parents' characteristics	**Mothers**	**Fathers**
	M (SD) *N* (%)	**M (SD) *N* (%)**
Age at diagnosis	33.69 (5.40)	36.89 (5.40)
Age at time of study	45.24 (5.17)	47.94 (5.03)
Education		
High school	11 (18)	23 (37)
Undergraduate	33 (53)	22 (51)
Graduate	18 (29)	7 (12)
Financial income		
-29,999$	12 (20)	2 (3)
30-49,999$	16 (26)	6 (10)
50,000$-	34 (54)	54 (87)
Marital status		
Same couple as dx	43 (69)	43 (69)
Separated/Divorced	19 (31)	19 (31)
Ethnicity		
Caucasian	61 (98)	62 (100)
Asian	1 (2)	

DFCI: Dana Farber Cancer Institute; dx: diagnosis

Figure 1

Bland-Altman plots for anxiety, depression and distress comparing children's ratings with their mothers' or fathers' ratings



BYI-A: Beck Youth Inventories - anxiety module; BYI-D: Beck Youth Inventories- depression module; DRS: Distress Rating Scale; ME: measurement error; ER: error range; T_b: Kendall's tau. The bold lines indicate the mean of the differences between the dyads and the segmented lines identify the limits of agreement (mean ± 1.96SD).

*p<.0.05

**p<0.01

***p<0.001

TABLE 2 Agreement on child anxiety, depression and distress in 62 mother-father-child triads of children treated for acute lymphoblastic leukemia

	Children	Mother-child agreement			Father-child agreement			Mother-Father agreement	
	M (SD)	M (SD)	ICC	t (d)	M (SD)	ICC	t (d)	ICC	t (d)
Children									
Anxiety (BYI-A)	46.87 (8.67)	52.60 (8.82)	0.23*	-4.30***(0.66)	51.92 (8.16)	0.44***	-4.82***(0.60)	0.49***	0.62 (0.08)
Depression (BYI-D)	45.24 (7.03)	48.74 (6.98)	0.47***	-3.06***(0.50)	49.36 (6.89)	0.43***	-4.67***(0.59)	0.37**	-0.62 (0.09)
Distress (DRS)	2.40 (2.37)	3.24 (2.44)	0.31**	5.86*(0.35)	2.26 (2.22)	0.17	-.39 (0.06)	0.16	-2.58**(0.42)

BYI-A: Beck Youth Inventories—anxiety module; BYI-D: Beck Youth Inventories—depression module; DRS: Distress Rating Scale. Effect sizes (d) interpretation: small (.20—.50), medium (.50—.80) and large (.80 or higher) (Cohen, 1988).

*p <0.05

**p <0.01

***p <0.001

TABLE 3 Hierarchical regressions predicting mother and father ratings on children's anxiety, depression and distress

	Mothers' ratings						Fathers' ratings					
	Anxiety (BYI-A)		Depression (BYI-D)		Distress (DT)		Anxiety (BYI-A)		Depression (BYI-D)		Distress (DRS)	
Predictors	**β**	**ΔR^2**	**β**	**ΔR^2**	**β**	**ΔR^2**	**β**	**ΔR^2**	**β**	**ΔR^2**	**β**	**ΔR^2**
Block 1		0.08*		0.28***		0.10**		0.27***		0.25***		0.01
Children's ratings	0.28*		0.42***		0.24*		0.45***		0.45***		0.16	
Block 2.1												0.23*
Child age	-0.02		0.04		-0.14		0.12		0.11		0.11	
Child sex	0.02		0.13		-0.14		-0.01		-0.03		-0.40**	0.15**
Parental income	-0.10		-0.04		-0.10		-0.05		-0.08		-0.29*	0.08*
Block 2.2				0.10**		0.10**		0.10**		0.10**		
Parental distress	0.23		0.05		0.32**		0.32**		0.32**		0.04	
Parental depression	0.23		0.10		-0.36		-0.19		0.06		-0.01	
Parental anxiety	0.32		0.34**		-0.10		-0.19		-0.18		-0.02	
Parental somatization	0.10		-0.02		0.11		-0.04		0.01		0.02	

BYI-A: Beck Youth Inventories—anxiety module; BYI-D: Beck Youth Inventories—depression module; DRS: Distress Rating Scale

*p <0.05

**p <0.01

***p <0.001

Supplementary Material

SUPPLEMENTARY TABLE S1. Agreement between ratings of parent and children on anxiety and depression

	Mothers' ratings				Fathers' ratings			
	Negative	Positive	Total	% agreement	Negative	Positive	Total	% agreement
Children's ratings: Anxiety (BYI-A)								
Negative	36	15	51	71	39	12	51	76
Positive	5	6	11	55	4	7	11	64
Total	41	21	62		43	19	62	
Children's ratings: Depression (BYI-D)								
Negative	47	8	55	85	45	10	55	82
Positive	3	4	7	57	4	3	7	43
Total	50	12	62		49	13	62	

Note. BYI-A: Beck Youth Inventories—anxiety module; BYI—D: Beck Youth Inventories—depression module; Negatives refer to scores below T=55. Positives refer to scores of 55 and above (Beck, 2005)

SUPPLEMENTARY TABLE S2. Agreement between ratings of parent and children on distress

	Mothers' ratings				Fathers' ratings			
	Negative	Positive	Total	% agreement	Negative	Positive	Total	% agreement
Children's ratings: Distress (DRS)								
Negative	28	18	46	61	38	8	46	83
Positive	8	8	16	50	9	7	16	44
Total	36	26	62		47	15	62	

Note. DRS: Distress Rating Scale. Negatives refer to scores below 4. Positives refer to scores of 4 and above (Boyes, 2013).

SUPPLEMENTARY TABLE S3. Agreement between ratings of mothers and fathers on children's anxiety and depression

	Mothers' ratings			
	Negative	Positive	Total	% overall agreement
Fathers' ratings: anxiety (BYI-A)				
Negative	37	6	43	
Positive	4	15	19	
Total	41	21	62	84
Fathers' ratings: depression (BYI-D)				
Negative	43	6	49	
Positive	7	6	13	
Total	50	12	62	79

BYI-A: Beck Youth Inventories—anxiety module; BYI—D: Beck Youth Inventories—depression module; Negatives refer to scores below T=55. Positives refer to scores of 55 and above (Beck, 2005).

SUPPLEMENTARY TABLE S4. Agreement between ratings of mothers and fathers on children's distress

	Mothers' ratings			
	Negative	Positive	Total	% agreement
Fathers' ratings:				
Distress (DRS)				
Negative	29	18	47	
Positive	7	8	15	
Total	36	26	62	60

Note. DRS: Distress Rating Scale. Negatives refer to scores below 4. Positives refer to scores of 4 and above (Boyes, 2013).

SUPPLEMENTARY TABLE S5. Repeatability analysis applied to mother-father differences on ratings of anxiety, depression, and distress of the child

	Lower limit	Upper limit	Mean (SD) of the difference	Measurement error	Error range	Kendall's Tau
Mother-father differences:						
Anxiety (BYI-A)	-16.24	17.59	0.68 (8.63)	6.10	11.96	-0.02
Depression (BYI-D)	-15.90	14.68	0.61 (7.80)	5.52	10.82	-0.07
Distress (DRS)	-4.9	6.86	0.98 (3.00)	2.12	4.16	0.12

BYI-A: Beck Youth Inventories — anxiety module; BYI-D: Beck Youth Inventories — depression module; DRS: Distress Rating Scale