

The Role of Maternal Distress in the Report of Behavioral and Emotional Problems among Children with Chronic Disabilities

Tamar Silberg, PhD,^{1,2} Amichai Brezner, MD,² Gilad Gal, PhD,³ Jaana Ahonniska-Assa, PhD,² and Miriam Levav, PhD^{2,4}

¹ Department of Psychology, Bar-Ilan University, Ramat Gan, Israel

² Edmond and Lily Safra Children's Hospital, Tel Hashomer Medical Center, Ramat Gan, Israel

³ School of Behavioral Sciences, Tel Aviv-Yaffo Academic College, Israel

⁴ Child Development Center, Kupat Holim Leumit, Jerusalem, Israel

ABSTRACT

Background: Assessments of psychological symptoms in children often rely on caregivers' (usually mothers') reports. However, the reliability may be affected by the caregivers' own emotional distress (ED). The main objectives of this study were to assess the variability in ED of mothers of children with chronic physical disabilities, and its association with the ratings of their children's emotional and behavioral problems.

Methods: Medical data of children diagnosed with chronic disabilities were analyzed (N = 72). Mothers completed the 12-item General Health Questionnaire (12-GHQ) to measure ED and the Child Behavior Checklist (CBCL) to assess children's emotional and behavioral problems. Mothers' ED scores were compared with community-based counterparts with similar socio-demographic characteristics (N = 657) from the Israel National Health Survey (INHS).

Results: Mothers of children with chronic physical disabilities had higher levels of ED compared to mothers in the general population. About 20% of the sample mothers had 12-GHQ scores compatible with DSM-IV depression or anxiety disorders. No differences in ED were found according to the type of child's disability or IQ score. Marked differences in CBCL scores were reported by mothers with high versus low ED, controlling for baseline maternal and child characteristics.

Conclusions: High levels of maternal ED were associated with mothers' reports on child's behavioral and emotional problems. This may contaminate the reliability of parental reports on their child's psychological state.

INTRODUCTION

Studies have reported on emotional and behavioral problems among children with chronic physical disabilities (1, 2). Often, the affected child's behavior and emotional reactions are perceived as products of complex interactions between biological and psychosocial factors known as the "brain-behavior link" (3-6) in which, the behavioral outcomes result from the severity of the child's impairment and/or from their functional limitation.

Also, it has been documented that raising a child with chronic disabilities is a risk factor for the development of psychosocial distress in the child's family (7, 8). Often, mothers of children with chronic disabilities report high levels of depression and other negative emotional states (9, 10), including elevated emotional distress (ED), compared to mothers in the general population (11, 12). A meta-analysis assessing psychological wellbeing showed that approximately 30–35% of mothers of children with chronic disabilities have elevated levels of depressive symptoms (13).

The association between children's disabilities and mothers' ED raises the possibility that mother's psycho-

logical state contaminates the reporting of her child's emotional state (14). Thus, rather than rating the child's "true" behavior or emotional state, these reports may be reflecting mother's biased perceptions of the child (15). In the literature concerning childhood psychopathology the need for receiving information from different informants has been widely acknowledged since such reports convey meaningful information about the child's psychological condition, such as behavioral consistencies, responsiveness to challenges and the like (16, 17). Smith (14) noted that with reference to children and adolescents, an external rater's perception is rooted in the relationship between the child's characteristics (i.e., age, gender, type of problem) and the rater's characteristics (i.e., teacher, parent, rater's psychopathology). In many cases these different perceptions provide a more comprehensive "picture" of the child's abilities.

Research shows that mothers of children who had traumatic brain injury (TBI), aged 5-15 years at the time of injury, experienced high levels of stress. This weakens their ability to adjust to the demands of their child's condition and, in turn, influenced their own emotional states (18). The authors, who used the 12-item-General Health Questionnaire (12-GHQ) to assess maternal ED, reported that 15-18% of the TBI-mothers scored higher GHQ scores compared to mothers of non-TBI children. In addition, a significant association was found between the number of problems mothers reported about their children, and their own level of distress ($p = 0.02$). In another study, mothers who had anxiety or depression reported up to four times more behavioral problems among their children compared to mothers of children without disorders (19). Accordingly, the concept of "cognitive bias" was suggested by the authors as an explanation of the possible impact mother's own emotional state has on her assessment of the child's emotional state.

Additionally, any evaluation of mothers' ED and children's emotional and behavioral state should also acknowledge the degree of ED in the study sample compared to the levels in the general population. Such benchmarking can provide important insights about the thresholds of maternal ED levels in the context of mothers of children with chronic disabilities. Whether or not ED levels of mothers of children with chronic disabilities exceed the overall "normal" average has implications for the interpretation of findings, as well as for practice.

Often studies assess ED in mothers that are simultaneously evaluating their children's emotional and behavioral state, which may cause "contamination" of the results.

Maintaining a time interval between the evaluation of the mothers' emotional state and the evaluation of her child's emotional and/or behavioral difficulties could possibly reduce such a mutual effect. Thus, concurrent evaluation of children's and mothers' distress may, in itself, affect the results of the evaluation. Using a unique evaluation design, in which mothers reported separately on their own levels of ED and on their child's emotional and behavioral problems, we aimed to overcome a potential bias exerted due to concurrent assessment of mothers' reports on their own as well as on their children's well-being. To our knowledge, there are no previous studies addressing this aspect of the methodological design.

OBJECTIVES

The main objectives of this study were to assess levels of ED among mothers of children with chronic physical disabilities (both developmental and acquired) and to examine whether mothers' ED scores are associated with their ratings of children's emotional and behavioral problems, controlling for children's baseline characteristics.

To assess mothers' ED scores we compared the levels of ED in a sample of mothers of children with chronic disabilities ("service-based sample") with those of mothers with the same demographic characteristics from the community-based Israeli National Health Survey (INHS) (20). We explored if maternal ED was related to child's level of impairment (as measured by general intellectual ability [IQ]).

METHODS

PARTICIPANTS

Service-based sample

Our study included 72 mother-child dyads.¹ Data were collected from medical files of children evaluated with an extensive set of neuropsychological evaluations administered between the years 2008 – 2012 in an outpatient unit at the Edmond and Lily Safra Children's Hospital, Israel. Eligible participants included children and adolescents between the ages of 5 and 18 years, with a disabling chronic condition (acquired brain injury [ABI] during the chronic stage, $n = 22$, or a developmental chronic [DC] condition $n = 50$), and their respective mothers (Table 1).

¹ In the current sample only information of Jewish mothers were analyzed since the INHS data has different GHQ cut off scores for the non-Jewish population

Table 1. Children's Demographic Characteristics

Characteristics	N (%)
Gender (girls)	31 (43.1)
Age in years, mean (SD)	10.8 (3.4)
Chronic condition [*] :	
Acquired Injury (AI):	22 (30.6)
TBI (severe):	17 (77.0)
Other ^{**} :	5 (23.0)
Developmental (DC):	50 (69.4)
Brain Tumors:	6 (12.0)
CP:	34 (68.0)
GMFCS I	6 (18.2)
GMFCS II	6 (18.2)
GMFCS III	10 (27.3)
GMFCS IV	7 (21.2)
GMFCS V	5 (15.1)
Other ^{***} :	10 (20)

Other acquired brain injuries such as: encephalitis (n₂), AVM (arteriovenous malformation) (n₃).

^{**} Other developmental chronic conditions such as: ARDS (n₁); Rolandic epilepsy (n₂); capillary leak syndrome (n₁); Kabuki syndrome (n₁); CF + Tourette syndrome (n₁); hypoxic ischemic encephalopathy (n₂); prenatal asphyxia (n₂).

INHS- Israeli National Health Survey

GMFCS_ Gross Motor Functioning Classification Scale [34]

COMMUNITY-BASED SAMPLE

We used data from the INHS (20) to derive a general population sample that allowed us to compare the distribution of ED scores in our sample to that of mothers from the general population (INHS). In the INHS, close to 5,000 non-institutionalized individuals were interviewed with the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) to determine the prevalence rates of selected psychiatric diagnoses, and were administered the 12-item-General Health Questionnaire (GHQ) to measure ED.

PROCEDURES AND MEASURES

During a routine neuropsychological assessment of the children, maternal ED was measured with the 12-item-General Health Questionnaire (12-GHQ) (21) at the end of the first interview.

The 12-GHQ has been used to screen for common mental disorders among adults in different countries and languages, including the Israeli component (INHS) of the WHO Mental Health Survey (19). Each item in the 12-GHQ is scored on a four-point scale (0-3) and refers to the preceding month: “not at all,” “no more than

usual,” “rather more than usual” and “much more than usual.” Scores range between 0-36, with higher scores indicating increased ED.

In addition, mothers completed the CBCL (22) within a month following the evaluation session.

The CBCL was used to evaluate the child's emotional and behavioral status as reported by the mother. The CBCL has frequently been used to measure levels of internalization and externalization problems observed among children, including those with chronic physical illness (23). The CBCL is a 113-item caregiver-report and/or self-report. Caregivers rate each item on a 3-point scale: 0 - not true, 1 - somewhat or sometimes true, and 2 - very true or often true for the past six months. The scores generate a Total Problems Scale, broadband Internalizing and Externalizing Syndrome Scales, and eight narrow band syndrome scales (e.g., anxious-depressed, aggressive behavior). Scores in narrow band syndrome scales range between Normal (T<65), Clinical Band (T = 65-70) and Clinical (T>70). Scores in summary scales range from Normal (T<60), Clinical Band (T = 60-63), and Clinical (T>64). There is extensive research evidence supporting the reliability, validity, and clinical utility of the CBCL (24). The checklist has been translated into 26 languages, including Hebrew (25). In our study, we omitted the Somatic Complaints scale in the CBCL from the analysis because it potentially presents a considerable bias when applied to children with chronic physical disabilities (26).

In addition, demographic data and IQ scores were obtained as part of the child's neuropsychological evaluation. All IQ scores were converted into z-scores in order to enable comparison between different IQ tests that were used, due to child's age at evaluation.

All procedures were approved by the hospital's Institutional Review Board and were in accordance with ethical standards.

DATA ANALYSIS

To assess the level of maternal ED and the comparable rate of common mental disorders (anxiety and mood disorders) we conducted secondary analysis on a sample of mothers (N = 657) from the INHS, aged 21-49 years with 10 years of schooling and above, to match to our target group characteristics (Table 2).

SPSS version 19.0 was used for statistical analysis. We tested for assumptions of normality, and performed Pearson correlations, two and one sample t-test for mean comparisons, and analysis of variance. A *p* value smaller than 0.05 was considered statistically significant.

Table 2. Demographic characteristics of the service based mothers and INHS sample mothers

Demographics	INHS (N*=657)	Service based (N*=72)
Mean age+ SD (years)	37.2(7.1)	39.7(5.4)
Marital status, n=living with partner (%)	580(88)	55(76.4)
Years of schooling (%)	14.3(2.6)	14.3(2.6)
Level of religiosity** (%)		
Secular	303(46.1)	38(53.5)
Religious	234(44.6)	29(40.9)
Orthodox	55(8.4)	4(5.6)
Employment Status (%)		
Non employed	50(9.3)	6(8.3)
Partial/full employment	488(90.7)	65(90.3)
Nr of children at home (%)		
1	134(20.4)	7(9.1)
2	243(37)	22(28.6)
3	156(23.7)	33(42.9)
>3	124(18.9)	15(19.4)

* n may vary due to missing data

** measured on the level of adherence to religious rules and rituals within the Jewish faith.

RESULTS

Comparisons between chronic condition groups (ABI and DC):

A comparison between children in the two chronic condition groups yielded significant differences in IQ z-scores with the ABI group ($M = -0.7$; $SD = 0.85$) and the DC group ($M = -1.3$; $SD = 1.2$), $t = -4.09$, $df = 67$, $p < 0.001$. In addition, there were significant differences in time since diagnosis between the groups: mothers of children from the DC group have been living with their children's chronic conditions for longer periods, on average, 85.7 months with a SD of 55.7 months, compared to the ABI group ($M = 31.2$ months; $SD = 29.4$ months), $t = 4.55$, $df = 71$, $p < 0.001$.

Differences in mother's age ($p = 0.9$), level of education ($p = 0.2$), employment status ($p = 0.9$), level of religiosity ($p = 0.2$), number of children in the family ($p = 0.7$), and the child's age ($p = 0.06$) and gender ($p = 0.5$) were not significant between these two groups. Additionally, no significant difference was found between the GHQ scores of mothers from both groups (DC [$M = 8.1$, $SD = 5.3$], and ABI [$M = 9.3$, $SD = 5.9$], $t = 0.86$, $df = 70$, $p = 0.2$).

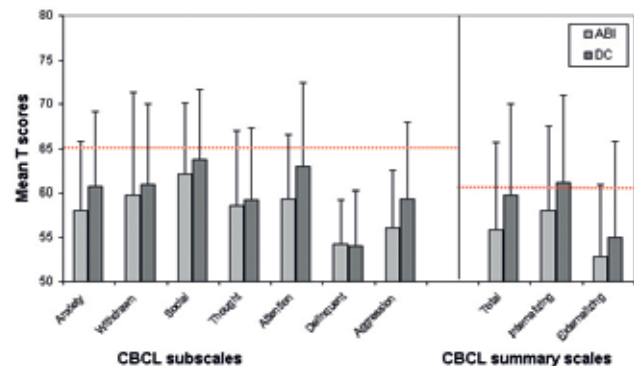
No significant associations were found between child's IQ score and mothers' reports on child's emotional and behavioral problems (r scores ranging from 0.05-0.16, $p > 0.05$). For the DC group, no correlations were observed between mothers' ED and the degree of the child's motor impairment (Gross Motor Functioning Classification Scale [27] [GMFCS]) ($r = 0.32$, $p = 0.1$).

Accordingly, the two groups were addressed as a single sample on all statistical comparisons, except for the profile analysis of the CBCL scores.

MOTHERS' REPORTS ON CHILD'S BEHAVIOR AND EMOTIONAL PROBLEMS

Analysis of variance of mothers' reports on children's emotional and behavioral problems between the two chronic condition groups (DC and ABI) showed no significant differences among all CBCL scales (see Figure 1). Scores did not reach clinical-band levels ($T > 65$) in any of the CBCL subscales. Only a slightly elevated score on the internalizing summary scale ($T > 60$) was observed for the DC group (mean $T = 61.1$; $SD = 9.9$).

Fig. 1. Differences in Emotional and Behavioral Problems between the two chronic disabilities groups



DC Developmental Conditions; ABI_Acquired Brain Injury; CBCL_Child behavior Checklist

$T > 65$ on CBCL Subscales indicates scores above the Clinical Band

$T > 60$ on CBCL Summary Scales indicates scores above the Clinical Band

MATERNAL EMOTIONAL DISTRESS (ED)

No significant associations were found in the service-based sample between the 12-GHQ scores and mothers' characteristics: age ($r = -0.03$, $p = 0.8$), education ($r = -0.06$, $p = 0.6$), number of children in the family ($r = 0.01$, $p = 0.9$) and level of religiosity ($r = -0.05$, $p = 0.65$). Furthermore, no significant relationship was found between mothers' ED and the time elapsed from diagnosis to evaluation ($r = 0.201$, $p = 0.11$).

In addition, no significant associations were found between mothers' 12-GHQ scores and child's characteristics such as child's IQ score ($r = -0.04, p = 0.7$), child's age ($r = 0.05, p = 0.67$), gender ($t = 0.41, df = 71, p = 0.6$).

Mothers in the service-based sample had significantly higher 12-GHQ scores with a mean of 8.4 (95% CI = 7.7-9.0) than mothers in the community-based sample (INHS) whose scores were on average 6.4 (CI = 6.2-6.6) $t = 83.2, df = 71 p < 0.001$.

To determine an "exceptionally" high level of ED we calculated the 12-GHQ mean scores for the community based-mothers who were clinically diagnosed with a common psychiatric disorder (anxiety or depression) during the prior 12 months ($n = 50$; anxiety rate, 2.4%; depression rate 5%). The mean 12-GHQ of the INHS mothers with psychiatric diagnoses was 13.5 (95% CI 12.1-15.0). Thus, we used a 13.5 12-GHQ score as the "cut off point" for delineating "exceptionally" high ED, and found that about 20% of the service-based mothers had a score of 13.5 or higher, compared to 9.6% of the INHS mothers' RR (rate ratio) = 2.24 (95% CI 1.18-4.23).

MOTHERS' LEVELS OF ED AND THEIR REPORTS ON CHILDREN'S EMOTIONAL AND BEHAVIORAL PROBLEMS

We found significant positive correlations between service-based mothers' ED scores and their reports on their children's emotional and behavioral symptoms, except for the thought problems scale (Table 3).

Subsequently, we used the "12-GHQ cut-off score" (12-GHQ = 13.5) for "exceptionally" high maternal ED to divide the service-based mothers into two groups (High

ED/Low ED). Grouped t-test was conducted on the two ED groups to examine the difference in the reported emotional and behavioral symptoms of the children. Comparison between the two ED groups showed statistically significant differences in scores of the CBCL scales. High ED mothers reported higher means on most of the CBCL subscales, including Internalizing and Externalizing Summary scales scores, compared to mothers with Low ED (Table 4). Differences on the Thought Problems scale and the Total score approached significance ($p = 0.06$). In addition, the High ED mothers reported CBCL scores above the Clinical Band in the Social Problems scale, Withdrawn and Attention Problems scales, as well as on the Internalizing Summary scale.

Table 4. Mean Differences (SD) between the reports of High and Low* mothers on child's emotional and behavioral problems (CBCL)

CBCL	High 12-GHQ mean scores (n = 13)	Low 12-GHQ mean scores (n = 59)	P value	η^2
Anxiety	62.8 (8.2)	58.2 (5.6)	0.04	0.145
Withdrawn	68.2 (12.3)	58.7 (9.9)	<0.01	0.075
Social Problems	69.6 (6.6)	61.5 (5.8)	<0.01	0.193
Thought	62.5 (8.4)	58.1 (8.2)	0.06	0.006
Attention	66.3 (9.5)	59.3 (6.5)	<0.01	0.145
Delinquent	57.5 (7.3)	53.7 (4.5)	0.01	0.129
Aggression	62.0 (9.3)	56.1 (6.6)	0.01	0.116
Total	61.4 (10.8)	56.2 (9.9)	0.06	0.164
Externalizing	58.5 (9.5)	52.5 (8.3)	0.01	0.080
Internalizing	64.1 (9.9)	58.0 (8.5)	0.02	0.146

CBCL = Child behavior Checklist

* According to the psychiatric 12-GHQ cut-off score

Table 3. Zero-order correlations between service based mothers' report on the CBCL scales and their 12-GHQ scores (n = 72)

CBCL scales	Mothers' 12-GHQ mean score	P value
Anxiety	$r = 0.28$	0.01
Withdrawn	$r = 0.24$	0.02
Social Problems	$r = 0.40$	0.001
Thought Problems	$r = 0.16$	0.11
Attention	$r = 0.30$	0.006
Delinquent	$r = 0.38$	0.001
Aggression	$r = 0.35$	0.002
Total	$r = 0.20$	0.04
Externalizing	$r = 0.30$	0.02
Internalizing	$r = 0.25$	0.004

CBCL = Child behavior Checklist; 12-GHQ- 12 items General Health Questionnaire

DISCUSSION

Our study showed that mothers' ED was related to their reports on their child's emotional and behavioral problems. Moreover, we found that among the various child and mother characteristics examined in the current study (age, gender, time since diagnosis and age, years of education), none were related to maternal ED. The high CBCL scores were significant for all CBCL scores (except for the Thought Problems subscale). Importantly, within High ED mothers, CBCL scores exceeded clinical significance levels for symptoms related to withdrawn behaviors and social problems, as well as attention problems which are related to child's academic performances.

These findings should be interpreted in light of the higher ED levels of mothers in our sample as compared

to mothers in the general Israeli Jewish population. We found that about 20% of the service-based mothers had 12-GHQ scores compatible with common affective disorders, in contrast to 7.4% of the mothers with these diagnoses in the general population matched for age and years of education.

Other variables reported in the literature as possibly related to maternal ED, such as mother's level of education and child's gender or general intellectual abilities (IQ) (28) had no relationship to mother's levels of ED. These findings are consistent with results from previous studies comparing ED among mothers of children with chronic conditions with those of controls with no childhood disabilities (29, 30), regardless of the type or severity of the disability (31). In addition, time since diagnosis which was different between the two chronic groups in the current study, was not related to mother's reports on her ED.

Furthermore, our study showed no significant differences between the two chronic disability groups (DC and ABI) on all CBCL scales and the overall levels of symptomatology did not exceed the normal range in any of the CBCL scales. These results differ from previous findings in the literature regarding the elevated percentages of emotional and behavioral problems among children with chronic conditions (2, 5).

Finally, we used IQ scores as a measure of the child's general level of intellectual functioning to rule out a possible relationship between the child's level of disability and her or his level of emotional and behavioral difficulties (5). The association between child's IQ and his or her behavioral and emotional problems did not reach significance. Similar results on children with developmental disorders (such as cerebral palsy) were reported by Parkes et al. (5) and Sigurdardottir et al. (32).

Comparable to other reports on biases due to the mothers' emotional state (33, 34), our findings suggest a possible overestimation of children's emotional and behavioral problems dependent on mothers' ED. Surprisingly, many of the published reports on behavioral problems among children with disabilities do not adequately address this possible effect when reporting on child's level of emotional or behavioral problems (1, 2, 5).

In addition, the time since diagnosis did not correlate with mothers' reports on their level of ED. Although child's chronic condition often results in multiple and ongoing stressors that affect long-term parental ED (35), some studies have reported on a decrease in parental distress across time (36) accounting for the null association found in the current study.

A recent report by Brossard-Racine et al. (37) indicated significant positive associations between high parental stress as assessed by the Parent Stress Index (PSI), and behavioral difficulties in all domains of the Strengths and Difficulties Questionnaire (SDQ) in a sample of children with CP. They suggested that high levels of parental stress could potentially exacerbate behavioral problems in the child. However, as our findings show that no other mother or child characteristic (i.e., age, gender, intellectual abilities, time since diagnosis, etc.) was related to mothers' reports on the child's emotional and/or behavioral difficulties, we espouse the interpretation of a "cognitive bias" as suggested by Najman et al. (19). As mentioned earlier, this "cognitive bias" infers that the mother's own emotional state may affect the inner representations of her child and play a significant factor in the assessment of her child's emotional state and behavior.

Evaluation design is a methodological consideration potentially impacting the association between a mother's ED and her child's behavioral problems, creating a possible mutual effect when the report on one's own emotional state affects the report on the other's psychological state. Our study uses a methodological design that enables a non-simultaneous assessment of mothers' and their children's behavioral and emotional problems. The mothers' completion of the 12-GHQ regarding their own levels of distress separately from their report on their child's psychological problems reduces the potential that the report on the child will be affected by their emotional reactive state. Therefore, if there is a relationship between mothers' ED states and children's CBCL scores three weeks after the mothers' own assessments, this relationship can be indicative of a correlation beyond what can be attributable to the potential cross-sectional effect of simultaneous reporting.

Several limitations in the current study should be addressed. First, the 12-GHQ used in our sample is a general screening tool, and should be considered as "focusing on breaks in normal function rather than on a lifetime trait," as expressed by Goldberg (38). Nonetheless, such instruments can be used in the planning of preventive interventions among mothers if found necessary. Second, although we found that the high ED group scored similarly to the mothers with a psychiatric diagnosis from the INHS, we did not conduct a direct clinical assessment to measure the psychiatric status of the service-based mothers. Thus, our results should be replicated in a larger sample using additional diagnostic measures. In addition, the current sample was compared to the large

INHS cohort, and, although informative, an additional matched control group could help interpret the differences between mothers of children with chronic disabilities and mothers of healthy children. Lastly, although the present study aimed to reduce contamination between mothers' reports on their own ED and reporting on their children's behavioral problems, there is still a need for more rigorous study designs to establish causality. For example, collecting information from fathers in the current study could help clarify the possible bias in mothers' reports on their child's psychological distress. Although approximately 80% of the mothers in the sample indicated living with a spouse, we did not have the specific information whether the spouse was the child's biological father. In addition, to account for the possible compromised reliability of parents reporting on their children, further studies should use reports made by teachers, medical professionals and the children themselves, in addition to parents' reports (37, 39, 40). Our findings support such an approach, to reduce the potential for erroneous findings regarding clinically significant high emotional and behavioral problems of children with disabilities. Given that there is no biological marker that definitively indicates the presence of an emotional or a behavioral problem, collecting data from multiple sources should be considered a gold standard when assessing the child's psychological state. Such a perspective is also in line with the ICF-CY (International Classification of Functioning Health and Disability- Children and Youth) framework (41), in which the child's status is not considered only a "medical" or "biological" dysfunction, but rather consists of the physical as well as psychological surroundings in which the child functions. Since information collected from multiple informants often reflects the different circumstances in which children's symptoms are manifested, it should be recognized as representing the interaction between the child and his or her environment (42).

In summary, as mothers with high ED report higher levels of emotional and behavioral problems than those with lower levels of ED, a potential proxy-bias in reporting on children's psychological problems should be considered in practice including also a short, reliable objective measure of mother's ED.

Acknowledgements

We thank the families and professionals that participated in this study, the research assistant Adi Zakay, MA, for data entering, and Shay Frank, MA, for contributing to the formulation of the methodological and theoretical aspects of the study. Finally we thank E. Shadmi, PhD, for her helpful comments and advice.

References

1. Baker BL, McIntyre LL, Blacher J, Crnic K, Edelbrock C, Low C. Preschool children with and without developmental delay: Behavior problems and parenting stress over time. *J Intellect Disabil Res* 2003; 47: 217-230.
2. Roberts K, Lawton T. Acknowledging the extra care patients give their disabled children. *Child Care Health Dev* 2001; 27: 307-319.
3. Barlow JH, Ellard DR. The psychosocial well-being of children with chronic disease, their parents and siblings: An overview of the research evidence base. *Child Care Health Dev* 2006; 32: 19-31.
4. Rutter M, Graham P, Yule W. A neuropsychiatric study in childhood. *Clinics in Developmental Medicine*, No 103. London: MacKeith Press, 1970.
5. Parkes J, White-Koning M, Dickinson HO, Thyen U, Arnaud C, Beckung E, et al. Psychological problems in children with cerebral palsy: A cross-sectional European study. *J Child Psychol Psychiatry* 2008; 49: 405-413.
6. Goodman R, Graham P. Psychiatric problems in children with hemiplegia: Cross sectional epidemiological survey. *BMJ* 1996; 312: 1065-1068.
7. Ritzema AM, Sladeczek IE. Stress in parents of children with developmental disabilities over time. *J Dev Disabil* 2011; 17: 18-31.
8. Wallander JL, Varni JW. Effects of pediatric chronic physical disorders on child and family adjustment. *J Child Psychol Psychiatry* 1998; 39:29-46.
9. Veissou M. Depression symptoms and emotional states in parents of disabled and non-disabled children. *Soc Behav Personal* 1999; 27: 87-97.
10. Davis E, MacKinnon A, Watters E. Parent proxy-reported quality of life for children with cerebral palsy. *Child Care Health Dev* 2012; 38: 553-560.
11. Manuel J, Naughton MJ, Balkrishnan R, Paterson Smith B, Koman LA. Stress and adaptation in mothers of children with cerebral palsy. *J Pediatr Psychol* 2003; 28: 197-201.
12. Wallander JL, Varni JW, Babani L, Banis HT, Wilcox KT. Children with chronic physical disorders: Maternal reports of their psychological adjustment. *J Pediatr Psychol* 1988; 13: 197-212.
13. Singer GH. Meta-Analysis of comparative studies of depression in mothers of children with and without developmental disabilities. *Am J Ment Retard* 2006; 111:155-169.
14. Smith SM. Making sense of multiple informants in child and adolescent psychopathology: A guide for clinicians. *J Psychoeduc Assess* 2007; 25:139-149.
15. De Los Reyes A, Kazdin AE. Informant discrepancies in the assessment of childhood psychopathology: A critical review, theoretical framework, and recommendations for further study. *Psychol Bull* 2005; 131: 483-509.
16. Achenbach, TM. As others see us: Clinical and research implications of cross-informant correlations for psychopathology. *Curr Dir Psychol Sci* 2006; 15: 94-98.
17. De Los Reyes A, Thomas SA, Goodman KL, Kundey SMA. Principles underlying the use of multiple informants' reports. *Annu Rev Clin Psychol* 2013; 9: 123-149.
18. Hawley CA, Ward AB, Magnay A, Long J. Parental stress and burden following traumatic brain injury amongst children and adolescents. *Brain Inj* 2003; 17: 1-23.
19. Najman JM, Williams GM, Nikles J, Spence S, Bor W, O'Callaghan M, et al. Mothers' mental illness and child behavior problems: Cause-effect association or observation bias? *J Am Acad Child Adolesc Psychiatry* 2000; 39: 592-602.
20. Levinson D, Zilber N, Lerner Y, Grinshpoon A, Levav I. Prevalence of mood and anxiety disorders in the community: Results from the Israel National Health Survey. *Isr J Psychiatry Relat Sci* 2007; 44: 94-103.
21. Levav I, Al-Krenawi A, Ifrah A, Geraysi N, Grinshpoon A, Khwaled R, et al. Common mental disorders among Arab-Israelis: Findings from the Israel National Health Survey. *Isr J Psychiatry Relat Sci* 2007; 44: 104-113.
22. Achenbach TM. *Manual for the Child Behavior Checklist /4-18 and Profile*. Burlington, VT. University of Vermont, Department of Psychiatry, 1991.

23. Lavigne JV, Faier-Routman J. Psychological adjustment to pediatric physical disorders: A meta-analytic review. *J Pediatr Psychol* 1992; 17: 133-157.
24. Achenbach T M, Rescorla L A. *Manual for the ASEBA School-Age Forms & Profiles*. Burlington, VT. University of Vermont: Research Center for Children, Youth, & Families, 2001.
25. Zilber N, Auerbach J, Lerner Y. Israeli norms for the Achenbach child behavior checklist: Comparison of clinically and non-referred children. *Isr J Psychiatry Relat Sci* 1994; 31: 5-12.
26. Friedman D, Bryant FB, Holmbeck GN. Brief report: Testing the factorial invariance of the CBCL Somatic Complaints scale as a measure of internalizing symptoms for children with and without chronic illness. *J Pediatr Psychol* 2007; 32: 512-516.
27. Palisano R, Rosenbaum P, Walter S, Russell D, Wood E, Galuppi B. Development and reliability of a system to classify gross motor function in children with cerebral palsy. *Dev Med Child Neurol* 1997; 39: 214-223.
28. Breslau N, Staruch KS, Mortimer EA. Psychological distress in mothers of disabled children. *Am J Dis Child* 1982; 136: 682-686.
29. Sayer M, Spurrier N. Families, parents and chronic childhood illness. *Family Matters* 1996; 44:12-15.
30. Ijezie E, Ojinnaka NC, Iloeje SO. Prevalence and pattern of psychological disorders in first-degree relatives of children with cerebral palsy in Enugu, Nigeria. *Eur J Sci Res* 2009; 38: 129-140.
31. Bourke-Taylor H, Howle L, Law M, Pallant JF. Self reported mental health of mothers with school aged child with a disability in Victoria: A mixed method study. *J Paediatr Child H* 2012; 48: 153-159.
32. Sigurdardottir S, Indredavik MS, Eiriksdottir A, Einarsdottir K, Gudmundsson HS, Vik T. Behavioral and emotional symptoms of preschool children with cerebral palsy: A population-based study. *Dev Med Child Neurol* 2010; 52: 1056-1061.
33. Ferguson DM, Lyskey MT, Horwood LJ. The effect of maternal depression on maternal ratings of child behavior. *J Abnorm Child Psychol* 1993; 21: 245-269.
34. Najman JM, Williams GM, Nikles J, Spence S, Bor W, O'Callaghan M, et al. Bias influencing maternal reports of child behavior and emotional state. *Soc Psychiatry Psychiatr Epidemiol* 2001; 36: 186-194.
35. Melnyk BM, Feinstein NF, Moldenhauer Z, Small L. Coping in parents of children who are chronically ill: Strategies for assessment and intervention. *J Pediatr Nurse* 2001; 27, 547-557.
36. Hoekstra-Weebers JEHM, Jaspers JPC, Kamps WA, Klip EC. Psychological adaptation and social support of parents of pediatric cancer patients: A prospective longitudinal study. *J Pediatr Psychol* 2001; 26: 225-235.
37. Brossard-Racine M, Hall N, Majnemer A, Shevell MI, Law M, Poulin C, et al. Behavioral problems in school age children with cerebral palsy. *Eur J Paediatr Neurol* 2012; 16: 35-41.
38. Goldberg DP. *The detection of psychiatric illness by questionnaire*. London: Oxford University, 1972 (Maudsley Monograph No. 21).
39. Vargus-Adams JN, Martin LK, Maignan SH, Klein AC, Salisbury S, The GMFM, PEDI, and CP-QOL and perspectives on functioning from children with CP, parents, and medical professionals. *J Pediatr Rehabil Med* 2011; 4: 3-12.
40. Silberg T, Tal-Jacoby D, Levav M, Brezner A, Rasovsky Y. Parents and teachers reporting on child's emotional and behavioral problems following severe Traumatic Brain Injury (TBI): The moderating effect of time. *Brain Injury* 2015; 29: 481-489
41. World Health Organization: *International Classification of Functioning, Disability and Health (ICF)*. Geneva, Switzerland: World Health Organization; 2001.
42. Dirks MA, De Los Reyes A, Briggs-Gowan M, Cella D, Wakschlag LS. Annual Research Review: Embracing not erasing contextual variability in children's behavior—theory and utility in the selection and use of methods and informants in developmental psychopathology. *J Child Psychol Psychiatry* 2012; 53:558-574.