Examination of mother-child agreement and its influencing factors in symptom reports and quality of life of depressed and non depressed children

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Dr.Kiss Enikő

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Dr.Kiss Enikő

Tutor: Dr. Vetró Ágnes

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Abstract

Introduction: Child psychiatrists are faced with low agreement between informants when questioning about children's problems. I studied mother-child agreement and possible influencing factors in reports of depressive symptoms and subjective quality of life of depressed and non-depressed children. **Hypotheses**: 1. mother-child agreement will be better in older children, in mother-daughter pairs, and in maternal depression 2. parents of depressed children will rate lower quality of life for their offspring, while healthy children's parents rate higher quality of life than children for themselves; agreement will be better in older children and in non-depressed children. **Methods**: Depressed sample consisted of N=354 children with Major Depressive Disorder between the ages of 7 and 15 (mean: 11.69 yrs (sd: 2.05 yrs). Non-depressed sample consisted of school-age children (N=1695), mean age was 10.34 yrs (sd: 2.19 yrs). Subsamples were used for different comparisons. Psychiatric diagnosis was obtained by semi-structured interview (ISCA-D), depressive symptoms were measured by BDI (mothers) or CDI (non-depressed children). Quality of life was obtained by self-report form (ILK). **Results**: Mother-child agreement increased as children got older. Mother and son reports were significantly different while mother and daughter reports were not. Girls had more severe symptoms but mothers did not follow this gender difference in their reports. Depressed mothers reported more serious symptoms for their children whose reports were also influenced by parental depression to a smaller extent. Depressed children's parent rated lower QoL than children for themselves while in non-depressed samples the opposite was observed. Agreement was significantly influenced by the health status of the child and only marginally by the age of the child. ILK questionnaire proved to be reliable and valid for the measurement of QoL in Hungarian children. **Discussion**: Individual reports were influenced mainly by individual characteristics, while agreement was modified only by the age of the child in symptom reports of depressed children. Quality of life is lowered by psychiatric illnesses. Assessment is further complicated by worse agreement. Therefore, it is important for practitioners to be knowledgeable of the factors influencing individual reports and mother-child agreement.

1. Introduction

1.1 Significance of agreement in child psychiatry

Obtaining adequate and substantial information is a fundamental necessity of child psychiatric evaluation. The person of the informant providing data about the symptoms and course of the illness of the child, however, is not as straightforward as it is with adult patients. The child can be too young or too ill to give reliable information or may not want to participate in the assessment. In most cases the caregiver, usually the parent is also interviewed. In the past there was an unquestionable practice of asking only the parent about the child's illness. Information collected from the child was considered secondary to the parent's report (Grills and Ollendick, 2002). Questioning the validity of the child's report was based on the assumption that children, especially at a young age lacked the necessary verbal and cognitive skills to describe adequately their own internal feelings (Herjanic et al., 1975; Schwab-Stone et al., 1994). Currently children are viewed as reliable, valid and valuable informants and whenever possible are included in the assessment. Using multiple informants, however, raised new concerns. When comparing information from different sources clinicians are faced with the low agreement between reporters. This has been shown in numerous studies in the past and at present in diverse ethnic and cultural backgrounds and virtually any community (Breslau et al., 1987; Bennett et al., 1997; Jensen et al. 1999; Najman et al., 2001; Cole et al., 2002; Ende and Verhulst, 2005) or clinic sample (Richters, 1992; Frick et al., 1994; Nguyen et al., 1994; DiBartolo et al., 1998; Grills and Ollendick, 2002**;** Berg-Nielsen et al., 2003; Kroes et al., 2003; Martin et al., 2004) in which it was examined. The low correlation suggests that each informant contributes its own set of information. One cannot replace the other. Any single assessment method provides only partial description of a child's behavior (Ende and Verhulst, 2005).

Questions about informant agreement and factors influencing it were raised and research turned toward this issue from the 1970's. The importance of studying the problem of informant discrepancy is highlighted by three factors. First, there is lack of a ”gold standard”, that is an undoubtedly reliable and adequate pool of information about the illness specifics of the child. Even if such a standard did exist, untrained informants observing children in different settings probably use different thresholds and have different abilities, skills and judgment biases. Therefore, reports of different informants must be compared to each other without exact knowledge of their validity. Second, confrontation of the informants with the discrepancies in order to reduce disagreement (eg. Nguyen et al., 1994) might pressure them to provide invalid ratings. Third, the reasons behind informant discrepancy are an important area of research which might add to our knowledge of the validity and reliability of information from different sources in the everyday clinical practice.

Reliance on different informants might lead to identifying differing children as having a psychiatric illness (Frick et al., 1994; Jensen et al., 1999; Braaten et al., 2001). In the study of Rubio-Stipec et al. (2003) depression was present in 3.1% of the community child sample when the informant was the parent and 4.9% when information was received from the youth. They found that the prevalence of all diagnoses varied by the informant. Depressive disorders were more prevalent when the informant was the youth while disruptive disorders were more prevalent when the informant was the parent. When considering information from two or more sources even finding a consensus on the target problems in therapy might become a difficult task. Hawley and Weis (2003) compared target problems for treatment identified by parents, children and therapists and found that 76.8% did not agree on any single problem and 44.4% failed to agree on even one general area of difficulty. This clearly illustrates the dilemma a therapist faces upon receiving differing information from various informants. When symptom reports from different sources are compared, the problem becomes even more complicated. Information about the symptoms of a disorder can be compared on the presence vs. absence, the level of severity or both. Low agreement between different raters is evident in every comparison regardless of the type of the disorder studied (in depression: Nguyen et al., 1994; Bennett et al., 1997; in anxiety disorder: Frick et al, 1994; DiBartolo et al., 1998; Comer and Kendall, 2004; in attention-deficit hyperactivity disorder (ADHD): Mick et al., 2000; Klassen et al., 2006).

In the present thesis I assessed agreement and related factors in two areas of child psychiatry. First, I compared maternal and child reports and analyzed agreement about the depressive symptoms of the child; second I assessed maternal and child reports and agreement about the quality of life (QoL) of depressed and non-depressed children.

1.2 Agreement in depression

The same issues and dilemmas emerge when comparing maternal and child reports of depressive symptoms of the child. Regardless of the method of information reporting (self-report vs. interview), the concordance between raters is in the low-medium range, Pearson correlation coefficients are between 0.009 and 0.45 (Nguyen et al., 1994; Bennett et al., 1997). In a study of Hungarian depressed adolescent population Csorba et al. (2003) found a mean kappa of 0.40 for mother-child agreement on symptoms of depression; more precisely low agreement on suicidal ideation (0.14), moderate value for depressed mood (0.48) and the highest agreement for suicide attempt (0.75). In some studies depressed youth reported higher rates of symptoms (Bennett et al., 1997; Jensen et al., 1999; Cole et al., 2002; van der Ende and Verhulst, 2005; Kassam-Adams et al., 2006) and incidence of major depressive disorder (MDD) (Braaten et al., 2001; Kassam-Adams et al., 2006) than their parents. The reasons for the observed discrepancies remain unclear. On the one hand, internal symptoms are considered to be less easily observed by parents. On the other hand, these symptoms are discussed less freely by children. It is also possible that parents and children have different thresholds for the disturbing effect of depressive symptoms. In cases where parental reports show more symptoms a plausible explanation might be that mothers are overestimating problems in order to justify the need for psychiatric evaluation and treatment or that children and adolescents might be reluctant to show their problems in full range due to fear of being diagnosed with a psychiatric condition and having treatment.

1.3 Agreement in QoL

1.3.1 Definition of QoL

A relatively new field of research is the quality of life of children. QoL is a holistic construct and as such it is universal, standard and multidimensional in a given culture, in a given time frame. It has no physical or temporal basis. It is not a directly measured entity and therefore, observed variables are only imperfect indices of the underlying construct. It has been described in different ways. According to the definition proposed by Wallander and Schmitt (2001): “QoL is the combination of objectively and subjectively indicated well being in multiple domains of life considered salient in one’s culture and time, while adhering to universal standards of human rights.” Another definition of the same construct is given by the WHOQOL Group (1994): “Quality of life is the individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns”. One must differentiate between objective and subjective QoL. Objective QoL focuses on the objective quality of the conditions in which people live whereas subjective QoL examines the individual’s subjective satisfaction with their lives. The two types of QoL naturally influence each other and cannot be completely independent. Therefore, it is best to examine some combination of the objective and subjective perspectives (Vetró et al., 2003).

Investigation of QoL mainly concentrated on adults in the past. Over 20,000 articles were published between 1980 and 1994 on this subject but only 3,050 (approximately 13%)

pertained to children (Wallander and Schmitt, 2001). Adolescents (between ages 13 and 18) were examined most frequently, less research involved younger children. Only 9% of the studies evaluated QoL based on children's reports. The amount of research on the quality of life of children has increased greatly over the last few years. The importance of this issue is underlined by the improved life expectancy in children with chronic, life threatening illnesses, the availability of more precise diagnostic tools in child and adolescent psychiatry, the resulting increase in recognition of psychiatric diseases in children and adolescents and the need for systematic assessment of therapeutic interventions. Quality of life as one of the newly incorporated outcome measures offers a unique opportunity to assess and follow the subjective consequences of the factors mentioned above.

I have found five quality of life evaluations in the Hungarian literature. Three involved adults (Czimbalmos et al., 1999; Szende and Molnár, 2000; Szende and Németh, 2003) and one book summarized the quality of life of the Hungarian population (Kopp and Kovács, 2006) in which only one subchapter dealt with the QoL of young people (16 to 24 year-old women and 15 to 19 year-old high school students). One review discusses the general characteristics and pitfalls of the evaluation of childhood quality of life (Vetró et al., 2003). The Health Behavior of School-Aged Children (HBSC) is an international study including Hungary started in 1985 which among other areas, became interested in children's satisfaction of life. The so called Cantrill ladder was introduced as a new instrument in 2002 in which children rated their own life satisfaction on a scale of 0 to 10 (Aszmann, 2003). Since the measurement of well being was based on only one question, it did not allow a more detailed analysis of the concept. I have not found any publications about the QoL of psychiatrically ill Hungarian child population.

1.3.2 Agreement in QoL

Inter-informant agreement about the QoL of children has been shown to have modest values (for a review, see Eiser and Morse, 2001) similarly to concordance on other issues, for example depressive symptoms of the child. While there are many publications about parent-child agreement on children's quality of life in physical illnesses such as epilepsy (Ronen et al., 2003), asthma (le Coq et al., 2000), cystic fibrosis (Havermans et al., 2006), cancer (Larson and Melin, 1992; Sawyer et al., 1999; Parsons et al., 1999; Vance et al., 2001; Russel et al., 2006), juvenile idiopathic arthritis (April et al., 2006), oral, oro-facial problems (Jokovic et al., 2003), there are less in psychiatric illnesses (ADHD: Baastiansen et al., 2004; Klassen et al., 2006) and in general population (Theunissen et al.,1998; Creemens et al., 2006;

Robitail et al., 2006). There are only a few that compare an ill population to a healthy one in the same study (Levi and Drotar, 1999; Coq et al., 2000; Russel et al., 2006) but their methodology varies greatly, making comparison and generalizability difficult.

There is a tendency for parents of ill children to score lower QoL than their child in somatic (Eiser and Morse, 2001; Vance et al., 2001; Ronen et al., 2003) and psychiatric samples (Bastiaansen et al., 2004; Klassen et al., 2006), while for parents of healthy children to rate better quality of life than children for themselves (Creemens et al., 2006). Theunissen et al. (1998) in a study of a representative 8-11 year-old Dutch population found that when the child and the parent both reported low QoL, the parent reported relatively lower QoL than the child. When the child and the parent both reported higher QoL the parent’s scores were higher than the child’s score. This would suggest that when the child is ill (QoL is low), the parent overestimates the effect of the illness and when the child is healthy (QoL is high), the parent underestimates the child’s problems compared to the child. Naturally, the lack of a gold standard which would define the true QoL of a given child complicates this issue further.

Parent-child agreement in general population samples is low to moderate and is dependent on the domain questioned and the method of interviewing (Levi and Drotar, 1999; Verrips et al., 2000; Creemens et al., 2006). Eiser and Morse (2001) concluded in their review that there was better agreement between parents and chronically ill children than parents and healthy children. Supporting this result, Russel et al. (2006) found better agreement in cancer patients than healthy controls and Robitail et al. (2006) showed higher concordance for children with special health care needs and their parents than for healthy parent-child pairs. Levi and Drotar (1999) however, found greater discrepancies in the reports of a cancer group. Comparison of agreement on quality of life between psychiatrically ill children and their parents versus healthy children and parents was not reported previously.

1.4 Factors influencing symptom agreement and concordance about quality of life in healthy and ill children

Research on the various factors influencing agreement identified several possible candidates. The most promising variables are methods of information collection, the type of symptom or domain assessed, characteristics of the proxy reporter, eg. psychopathology, level of stress, illness status of the sample, age and gender of the child and socio-economic status (SES) of the family.

1.4.1 Method of obtaining information

It is crucial in studying inter-informant agreement that the criterion measure (self-report questionnaire, semi-structured or structured interview) must meet at least the conventional standards of relative reliability and stability. Further prerequisite is ideally the same or at least similar wording and content of tests for different informants. When the reporters are children, comprehension of the concepts tested might also present a problem. Breton et al. (1995) examined several aspects of a structured interview (Diagnostic Interview Schedule for Children, DISC) and found that only 16-56% of children aged 9-11 understood the questions of the interview, and that they had difficulty with understanding time concept. Rates of comprehension improved with age but differentially for different disorders. Analyses also revealed that as word length increased, the rate of understanding decreased. Studies with clinical interviews have tended to yield higher inter-rater reliability estimates than those with self-report forms but the degree of interview structure did not seem to affect parent-child agreement (Grills and Ollendick, 2002).

Verrips et al. (2000) assessed parent-child agreement about quality of life of children by different methods and compared results from face-to-face interviews, telephone interviews and mailed questionnaires. Their sample consisted of 14-years-old low birth weight children and their parents. Parent-child agreement was highest in the telephone interview, somewhat lower in the mailed questionnaire and lowest in the face-to-face interview. It is possible that the personality and style of the interviewer influenced the willingness of the interviewee to disclose information. In the other two methods agreement was higher because some parents and children might have ignored the instructions about independent completion of the tests. Based on the above, it is important in agreement research to apply the same test by the same method in comparison studies or longitudinal investigations.

1.4.2 Type of symptom or QoL domain

Mother and child reports and agreement are also influenced by the type of the symptom or domain being assessed. Several studies support the idea that the more overt externalizing symptoms or domains are more easily noticed by parents while the more covert internalizing thoughts or domains are more difficult to observe (for a review, see De Los Reyes and Kazdin, 2005). Bennett et al. (1997) found higher mother-child agreement in a sample of girls on several behavioral symptoms but poor agreement on internalizing symptoms. In a sample of boys, Youngstrom et al. (2000) similarly found higher concordance on externalizing than internalizing symptoms. Nguyen et al. (1994) observed a sample of 5 to 11 year-old children and found that agreement was better for the presence or absence of behavioral than ideational symptoms but concordance about the severity of these two symptom categories were not significantly different.

The same trend is noticeable in other areas of agreement research. When quality of life is examined in various domains of the children’s lives, more observable domains show better concordance between informants. Physical and cognitive domains assessed by functioning in school showed better agreement while social and psychological domains presented larger discrepancies in Robitail et al.’s international study (2006, 2007) involving community samples from 7 European countries. Furthermore, better correlation was found between parent-child reported QoL of observable domains and worse in covert domains in child patients with epilepsy (Ronen et al., 2003), cancer (Parsons et al., 1999; Chang and Yeh, 2005; Russel et al., 2006), cystic fibrosis (Havermans et al., 2006), and oro-facial problems (Jokovic et al., 2003). Klassen et al. (2006) assessed parent-child concordance in children with ADHD and found the lowest agreement in the domain of self-esteem and the highest agreement in the domain of physical functioning.

1.4.3 Maternal psychopathology and stress

It has been shown that the incidence of depression is greater in first degree relatives than in the general population (Neuman et al., 1997; Rice et al., 2002; Kiss, 2007/a). This has been supported by the results of agreement studies on depressed child populations that examined the depressive symptoms of the mothers as well. Renouf and Kovacs (1994) found that the rates of maternal depressive symptoms were in the moderate – severe range on self-report questionnaires. Nguyen et al. (1994) examined agreement between prepubertal depressed children and their mothers and found that 26% of the mothers scored above the cutoff for depression (13 points) on the Beck Depression Inventory (BDI, Beck et al., 1961).

An important source of potential bias in parental reporting is the parent’s own psychopathology especially if it is the same as in the child (Kassam-Adams et al., 2006). Depressed mothers report more depressive and behavioral symptoms in their children than the children report about themselves (Richters, 1992; Renouf and Kovacs, 1994; Chilcoat and Breslau, 1997; Berg-Nielsen et al., 2003; Kroes et al., 2003). Furthermore, the more depressed the mothers are, the more serious they rate their children’s negative behavior (Youngstrom et al., 1999, 2000). Reporting more symptoms in the children by depressed than non-depressed mothers, however, does not necessarily mean a biased view. Reasonable alternatives are that offsprings of depressed mothers suffer higher than average rates of problems or that depressed mothers are more accurate raters of their children’s depressive symptoms than other informants.

In spite of the influence of maternal depression on maternal reports, however, the literature is ambiguous about the effect of maternal psychopathology on mother-child agreement. It has been reported that maternal depression improves (Conrad and Hammen, 1989), worsens (Renouf and Kovacs, 1994; Youngstrom et al., 2000; De Los Reyes and Kazdin, 2005), or has no detectable effect on parent-child agreement (Breslau et al., 1987; Nguyen et al., 1994). One possible explanation for lower concordance in the case of depressed mothers is the “depression distortion hypothesis” that says that more depressed adults are likely to report more negative behaviors for their child than would independent observers (Briggs-Gowan et al., 1996; Youngstrom et al., 1999, 2000). The opposing view which holds that depressed mothers are more accurate observers of their children’s depression, is based on earlier experimental studies that showed that depressed individuals have better recall of mood congruent information than non-depressed ones (Bower, 1981; Blaney, 1986). Richters (1992) reviewed 22 studies examining inter-informant agreement for evidence of distortion of child symptoms by depressed mothers and concluded that “there is no empirical foundation for the widespread belief that depressed mothers have distorted perceptions of their children’s problems.” He pointed out several possible flaws in the literature, including the lack or inadequacy of criterion informants (comparison with an external rating, that is to have another reporter to whom maternal ratings can be compared), the lack of criterion ratings (the requirement of an independent, validated criterion as a standard rating in the lack of gold standard) , inadequate validity of the measurements used, situational and behavioral non-correspondence (different informants rate child behavior in different context, observe different behaviors), degree of independence of other raters from maternal perceptions and, finally, statistical considerations (appropriate strategies for studying agreement).

In a survey of adult participants, Heinonen et al. (2004) showed that judgments about global QoL were largely influenced by current emotional state. Considering the modifying effects of the mother’s depressive symptoms on reports about similar symptoms of the child (as discussed above), it is possible that the same effect has an impact on maternal reports of child QoL as well. Researchers found that while parental depression did not affect their ratings of child QoL, increased parental stress about the child’s illness was associated with worse parent-rated QoL in chronic somatic ill samples of children (Vance et al., 2001; White-Koning et al., 2007). According to another study on epileptic patients, parental distress had greater influence on parental reports than stress (Annett et al., 2003). Creemens et al. (2006)

found significant correlation between parents' ratings of their own QoL and their ratings of the child's QoL in a healthy sample of 5 to 8 year-olds. These studies, however, did not analyze the effect of the above discussed variables on parent-child agreement.

1.4.4 Health status of the child (healthy vs ill)

An interesting question is whether the health status of the sample affects agreement. More precisely formulated whether agreement is different in a healthy sample from an ill one; whether there are differences according to disease type or severity of the disorder.

Grills and Ollendick (2002) concluded in their review that in the majority of parent-child agreement studies the influence of disorder severity does not appear to be supported. As far as differences in concordance based on disease type, they found increased disagreement regarding internalizing disorders (such as depression and anxiety) and better agreement in externalizing disorders (eg. fire setting, aggressive behavior). An important prerequisite of studying this question is to have well-defined and diagnosed samples with different illnesses and to ask about the same symptoms using the same measure. Garber et al. (1998) compared mother-child concordance in children with recurrent abdominal pain, emotional disorders (mood and anxiety disorders) and a well group. They found that children diagnosed with emotional disorders showed the highest disagreement while well children and their mothers were in the highest agreement about symptoms of the child. Children with somatic problems and their mothers were in mild disagreement compared to the other two groups. They proposed that since children in the well group actually had fewer symptoms, there was less for mothers and children to disagree about. The high disagreement of the emotional sample might have been a reflection of a broader communication problem and associated conflict that have been observed in families with depressed children.

Agreement about quality of life offers a better opportunity to study differences in concordance in various samples due to the relative independence of the studied feature from the health status of the sample and to measurements which are adequate for both healthy and ill populations. However, results in the literature are conflicting. According to the review by Eiser and Morse (2001) there was better agreement between parents and chronically ill children than parents and healthy children. Supporting this result, Robitail et al. (2006) showed higher concordance for the QoL of children with special health care needs and their parents than for healthy parent-child pairs. Russel et al. (2006) compared parent-child concordance about QoL of child cancer patients to healthy controls and found that agreement was better in the cancer group. Significant parent-child differences were observed in 8 of 10 scales in the healthy sample while only in 2 scales in the cancer group. Levi and Drotar (1999) found greater discrepancies in the reports of parents and children with cancer than in a healthy comparison group, even though the differences did not reach statistical significance in either sample. I came across only one study of psychiatric patients that attempted to differentiate between QoL of children with different diagnoses (Baastianen et al., 2004). Unfortunately, only parent-reported and child-reported QoL was compared among the groups, agreement was not.

1.4.5 Child characteristics

1.4.5.1 Age of the child: Studies have found that parent-child agreement improved with increasing age among psychiatric outpatients (Renouf and Kovacs, 1994) and to a lesser extent in community samples (Jensen et al., 1999). Other studies did not find significant age effect on parent-child symptom agreement, possibly due to a restricted age-range (Briggs-Gowan et al., 1996; Bennett et al., 1997) or dichotomization of age groups (Breslau et al., 1987; Nguyen et al., 1994). De Los Reyes and Kazdin (2005) note in their review that inconsistent findings could be due to different methods across studies, small sample sizes, and the categorization of children's ages.

The same trend can be observed in QoL agreement research. Concordance increases with age in some studies in general child population (Robitail et al., 2006) and epileptic samples (Ronen et al., 2003). In a study of children with oral, dental problems, however, less concordance was reported for older children (Jokovic et al., 2003). Theunissen et al. (1998) also found less agreement for 10-11 year-olds than 8-9 year-olds in their representative community sample. Child's age was not associated with agreement on QoL in children with cancer (Vance et al., 2001). Based on the conflicting results Eiser and Morse (2001) concluded in their review that there was no age effect on parent-child concordance of QoL.

1.4.5.2 Gender of the child: Child gender has been reported to affect parent-child concordance with regard to some symptoms but not others (for a review, see Grills and Ollendick, 2002). Jolly et al. (1994) found that girls' self-reported depressive symptoms were more comparable to observer ratings than boys'. Frank et al. (2000) found in an in-patient sample that discrepancies in the ratings of the emotional impairment of the child were greater in mother-son pairs than in mother-daughter dyads.

The effect of the child's gender on QoL agreement is also ambiguous. Eiser and Morse (2001) found no association between gender and mother-child agreement in their review. Jokovic et al. (2003) showed better agreement in boys with oral problems and their mothers. Robitail et al. (2006) reported higher agreement for girls and parents in a general population sample.

1.4.5.3 Socioeconomical status (SES): Family SES does not seem to have a significant impact on mother-child agreement on child's depressive symptoms (Nguyen et al., 1994; Renouf and Kovacs, 1994; Bennett et al., 1997; Mick et al., 2000; Youngstrom et al., 2000) or on child QoL (Theunissen et al., 1998; Cavallo et al., 2006).

1.5 Methodological considerations

Given that multiple variables appear to affect mother-child agreement in symptom report, an important concern is the extent to which these factors interact in their effects. However, most studies of parent-child concordance have employed univariate statistics (e.g., Nguyen et al., 1994; Bennett et al., 1997) and thus did not model interactions among variables.

The most frequently used Pearson product-moment correlation coefficient (Pearson r) provides information on the covariation among scores but does not indicate absolute agreement (Eiser and Morse, 2001). More appropriate statistical methods are intraclass correlation coefficients (ICC) for continuous variables (De Civita et al., 2005) or kappa statistics for categorical ones. It is also useful to examine mean differences between parents' and children's reports (Creemens et al., 2006). In spite of the above considerations most comparison studies still apply Pearson r statistics only. There is a need to compare samples from different backgrounds by more complex methods.

Even though there are various possible combinations of informants, this work has concentrated on parent-child concordance, especially mother-child agreement, since usually the mother is the most informed and most available informant in child psychiatric evaluation.

2. Aims and hypotheses

I studied mother-child agreement about the symptoms of children in a sample with childhood-onset depression:

- I hypothesized that mother-child agreement will improve with the age of the child due to higher levels of social-cognitive development and better communication skills; and that concordance will be better in mother-daughter pairs than in mother-son pairs, possibly due to greater degree of empathy in same sex pairs and higher self-consciousness in girls (Jolly et al., 1994).
- I hypothesized that agreement will improve with maternal depression, because depressed mothers would be more accurate observers of their children's depression

and have better recall of such mood congruent information (Bower, 1981; Blaney, 1986; Richters, 1992; Burt et al., 1995).

I studied mother-child agreement about the quality of life of children in depressed and non-depressed samples:

- I hypothesized that parents of depressed children rate lower quality of life for their offspring, while healthy children’s parents rate higher quality of life than children for themselves. This is probably due to the increased worry and attentiveness of an ill child’s parent compared to the relative carefree attitude of a healthy child’s parent.
- I hypothesized that mother-child agreement is higher in healthy samples than in depressed ones since there is no anxiety in the mother concerning the child’s well-being.
- Finally, I hypothesized that agreement increases with the age of the child regardless of illness status due to developing insight and increasing ability to share inner feelings and thoughts.

My further aim was to adopt a quality of life scale in Hungarian that is valid, reliable, and suitable for the evaluation of healthy and ill child and adolescent population as a self-report and a proxy measure. By such a test, the quality of life modifying effect of somatic and psychiatric illnesses become assessable and comparable, the changes in the condition of an ill child become observable.

3. Methods

3.1 Participants

3.1.1 Depressed sample

Children in the depressed sample were enrolled in a study of genetic and psychosocial risk factors in childhood-onset depression between April 2000 and February 2006. The study recruited children through 23 mental health facilities (six of which had both inpatient and outpatient units) across Hungary. Children presenting at each site were scheduled for assessment if they met the following criteria: 7.0 years to 14.9 years old at study entry, not mentally retarded, no evidence of major systemic medical disorder, had available at least one biological parent and a 7 - 17.9 year-old sibling (required by the study’s genetic component), and attained a predetermined cut-off score on either a child or parent version of various depressive symptom screening scales designed for this project. Children meeting these criteria were scheduled for a two-part evaluation, conducted on two separate occasions about 6 weeks apart by different clinicians. Written consent was obtained for participation signed by both parents and the child in accordance with the legal requirements.

The first part of the assessment contained the administration of the “Mood Disorder Module” of a diagnostic interview (described below), as well as the Intake General Information Sheet (IGIS), a comprehensive socio-demographic and anamnestic data form. Participants also completed various self-rating scales. Children who met DSM IV criteria for mood disorder at the first assessment were scheduled for further evaluation. The second part of the assessment involved a full diagnostic evaluation and completion of maternal self-rated scales. Each diagnostic interview was conducted separately with the parent about the child, and the child about him/herself. Results of the assessments and associated documentation (e.g., psychiatric records) were subjected to final consensus diagnostic procedure (Maziade et al., 1992). Pairs of senior child psychiatrists trained as Best Estimate Diagnosticians separately reviewed all material and derived consensus diagnoses together. "Caseness" was determined based on best-estimate consensus (Kovacs, 1984), operational rules were used to define disorder onset and recovery.

Children enrolled by December 31, 2003 were included in the agreement study about depressive symptoms of the child. Special selection criteria were the following: qualified DSM IV criteria of a major depressive disorder (MDD) at the time of the investigation and biological mothers as parental informants. The final sample for this study included N= 354 children and their mothers. There were 158 girls (44.6%), the average age at the time of the assessment was 11.69 years (sd: 2.05 years, range: 7.31 – 15.36 years). Racial composition was representative of the population of Hungary. Boys were significantly younger than girls (mean age boys: 11.28 years, sd: 1.99 years; mean age girls: 12.19 years, sd: 2.03 years; t: 4.22, p<0.001). Mothers were 36.64 years old on average (sd: 4.97 years, range: 25.76 – 55.01 years). They had 11.4 years of formal education (sd: 2.9 years, range = 0-21 years). A mean of 4.6 people were living together in one family (sd: 1.14, range: 2-10 people/household). There were no differences in mother’s education or number of people living together by child sex.

Maternal self-report form measuring depressive symptoms was added later to the protocol, therefore analyses including those were carried out on a reduced sample (N=306) comparable to the whole sample in age, ethnic distribution, maternal education and number living in household. Girls were underrepresented (N=129) compared to boys (N=177; $chi^2=5.98$, p<0.01).

Depressed sample of the QoL agreement study consisted of children from the childhood-onset depression study. Only those children were included in the analysis that had Major Depressive Disorder by DSM IV criteria and were in episode at the time of assessment. The final sample consisted of N=248 children (Table 1).

Table 1. Demographic characteristics of the depressed and non-depressed samples

Demographic variables	Depressed sample N=248	Non-depressed sample N=1695	p
Age of child (years)			
Mean (sd)	11.45 (2.02)	10.34 (2.19)	0.000
Range (years)	7-15	7-15	
Gender of child			
Boys N (%)	130 (52.4)	744 (43.9)	0.012
Girls N (%)	118 (47.6)	951 (56.1)	
Number of children in family mean (sd)	3.1 (1.4)	2.1 (0.9)	0.000
Birth order of child mean(sd)	2.1 (1.2)	1.7 (0.9)	0.000
Divorce (%)	41.1	18.9	0.000
Financial status (%)			
Below average	35.5	14.2	
Average	56.5	55.3	0.000
Above average	8.1	30.5	
Education of mother (year) mean (sd)	11.1 (2.7)	13.1 (2.3)	0.000
Hospitalization of mother due to alcohol or psychiatric problem (%)	14.9	1.2	0.000
Severity of depression (%)			
Mild	19.4	-	
Moderate	44.0	-	
Severe	36.7	-	
No. of depressive episodes mean (sd)	1.4 (0.58)	-	
Suicidal ideation (%)	45.3	-	
Suicidal attempt (%)	11.9	-	
Hospitalization (%)	31.9	-	
Psychiatric medication (%)	60.5	-	

3.1.2 Community sample

A community sample was recruited from 2 regions of Hungary (north-west and south-east). 1st – 8th grade elementary students were approached from 9 elementary schools in Szeged (2 schools), Győr (4 schools) and the vicinity (Kapuvár, Csorna and Szőreg, 1 school each). Children participated after receiving written consents from the parents. Testing was organized through the schools. Every child received a parental test package including all the forms and parental consent. Parents wishing to participate completed the forms at home and returned all questionnaires and the signed consent to school. Only those children were tested whose parents sent back the completed package. Children filled the questionnaires in school during class under supervision. The questions were read out loud in 1st through 3rd grades; children completed the forms by themselves in higher grades. Members of the research team or psychology/medical students were present during testing in some schools, in others teachers were instructed before distributing the questionnaires. Testing was done anonymously, child-parent pairs were identified by identical 6-digit code numbers. 5224 families were contacted initially, 68% of parents agreed to participate, 55% of children completed the forms (N=2873).

In the validity study the final number of participants were N=2620. Mean age of the sample was 10.45 years (sd: 2.2 years), there were 56% girls (N=1460). Socio-demographic data is shown in Table 2. Test-retest reliability was carried out on a reduced sample (N=155). It included girls in 66% (N=99), mean age was 9.88 years (sd: 2.3 years). Retesting was done on average in 3 weeks (mean time difference: 23 days, sd: 3 days).

In order to measure discriminative validity of the QoL scale I selected those children who either had depressive symptoms above a predetermined cutoff or did not have any depressive symptoms. Child Depressive Inventory (CDI, Kovacs, 1992) was used to assess symptoms of depression. Those children qualified for the depressed group who scored 7 points or above (N=388, 14.8% of the whole sample); girls were overrepresented (61.9%, N=240). The other group consisted of children who scored 0 points, that is, they were free from depressive symptoms (N=279, 10.6% of the whole sample); gender ratio was balanced (50.5% girls, N=141). Mean age was not different in the two groups (10.71 years, sd: 2.24 years, and 10.04 years, sd: 2.24 years, respectively).

The study on agreement about the quality of life of children had further limitations; specifically participants had to have their biological mothers as informants on all tests and had to be free from chronic somatic illness and symptoms of depression. Due to the more strict inclusion criteria, the sample size was smaller. I excluded N=198 children due to incomplete data, N=274 subjects whose informant was not the mother, N=72 children who had chronic somatic illness, and N=381 children who had substantial depressive symptoms. Final number of participants was N=1695 (Table 1). Depressive symptoms were screened by the short version of the Child Depression Inventory (CDI, Kovacs, 1992). I excluded those children who scored above 7 points, reported as a clinical cut-off for depression in the literature.

Table 2. Socio-demographic characteristics of the school sample in the ILK validity study

		6-9 years	**10-12 years**	**13-15 years**	**All**
N		982	1080	558	2620
Mean age of child (year)(sd)		8,07 (0,77)	11,03 (0,82)	13,54 (0,6)	10,45(2,21)
Education of father (%)					
	Less than elementary	0,2	0	0	0,1
	Elementary school	4,2	6,1	3,6	4,8
	Vocational school	30,2	33,9	29,8	31,7
	High school (grad.)	32	30,5	30,8	31,1
	College/univ. degree	33,4	29,4	35,9	32,3
Education of mother (%)					
	Less than elementary	0,1	0	0,2	0,1
	Elementary school	5,6	6,9	5,7	6,2
	Vocational school	15,5	14,8	16,9	15,5
	High school (grad.)	42,4	43,3	40,2	42,3
	College/univ. degree	36,4	34,9	37,1	35,9
Subjective financial status (%)					
	Under average	16,7	16,3	15,6	16,3
	Average	52,2	54,8	55,5	54
	Above average	31,1	28,9	28,9	29,7
School achievement of child (%)					
	Sufficient	0,9	2,5	6,7	2,8
	Satisfactory	10,8	22,9	28,9	19,7
	Good	43	44,8	43,3	43,8
	Excellent	45,2	29,7	21,1	33,7
No. living in household (mean, sd)		4,03(1,1)	3,97(1,07)	3,94(1,1)	3,99(1,09)
Divorce (%)		17	21	21,9	19,7

sd: standard deviation

3.2 Measurements

3.2.1 Interview Schedule for Children and Adolescents-Diagnostic Version (ISCA-D)

The diagnostic interview, the Interview Schedule for Children and Adolescents - Diagnostic Version (ISCA-D), is an extension and modification of the Interview Schedule for Children and Adolescents (ISCA) (Sherill and Kovacs, 2000). It is a semi-structured symptom-oriented diagnostic interview for children aged 8 to 17 years. It covers the relevant Axis-I DSM-IV diagnoses as well as some DSM-III disorders, and yields symptom ratings and diagnoses for "current" as well as "lifetime" disorders. It is organized in sections, each section covering a major group of psychiatric disorders (for example mood disorders, anxiety disorders, etc.). Symptoms are rated on presence/absence, severity and length. Typically, the parent is interviewed first about the child, followed by a separate interview with the child conducted by the same interviewer. Ratings are entered during the interview. Each reporter receives individual ratings and there is a third set of overall ratings, which incorporates the information from both informants for each item. Diagnostic decisions are based on the clinician's overall ratings for each relevant item (Sherrill and Kovacs, 2000).

Interviews were administered by child psychiatrists and psychologists who completed 3 months of didactic and practical training in the semi-structured interview technique. They were required to reach an average of 85% symptom-agreement on 5 consecutive videotaped interviews against "gold standard" ratings being provided by the trainers. Routine monitoring and follow-up training sessions served to minimize rater drift. All interviews were audio taped. Inter-rater agreement was computed based on N=46 videotaped interviews. Kappas (based on paired ratings) for current MDD symptoms from the child interviews ranged from .63 to .92, with 73.3% of the coefficients above .70; kappas were similar from the parent interviews (ranging from .65 to .87, with 93.3% above .70). For the clinician's overall rating of the MDD symptoms (based on both child and parent interviews), kappas ranged from .64 to .88 with 80% at or above .70.

Children's depressive symptom severity was computed separately for the mother's and the child's report of depressive symptoms taken from the 2nd ISCA-D assessment. Each symptom was rated on a 3 point scale: 0 = not present, 1 = subthreshold and 2 = threshold/clinical. A total of 15 symptoms were added to compute overall severity scores, thus the possible range was 0 to 30. Three *depressive symptom clusters* were grouped: Mood Cluster including depressed mood, irritability and loss of interest, Cognitive Cluster including feelings of worthlessness, inappropriate guilt, diminished ability to concentrate, recurrent thoughts of death and suicide, and Vegetative Cluster including weight gain, weight loss, insomnia, hypersomnia, psychomotor agitation, retardation, and fatigue. The score ranges of these three categories were 0-6, 0-10, and 0-14, respectively.

Mother-child agreement: Based on the method of Renouf and Kovacs (1994), agreement scores were computed by the following way on every depressive item: 0 = mother and child disagreed on the presence of the symptom, 1 = they agreed on the presence but not the extent of the symptom, 2 = they agreed on both the presence and the extent. Final score of each mother-child pair was computed by adding the individual agreement scores of all symptoms. Higher overall scores showed better inter-informant agreement.

3.2.2 Beck Depression Inventory (BDI)

Maternal depression in the depressed sample was measured by Beck Depression Inventory (BDI; Beck et al., 1961). It consists of 21 items, each graded by 4 statements ranked by increasing severity. Extensive data is available on its reliability and validity. Internal consistency yielded a coefficient alpha of .81-.86 depending on the type of the population; concurrent validity of the BDI to clinical ratings was .60-.72 (Beck et al., 1988). Overall scores range from 0 to 63. The questionnaire was constructed to reflect depressive symptoms or dysphoria and not necessarily an indication of clinical depression. It has been widely used and showed excellent reliability and validity (Beck and Steer, 1987; Beck et al., 1988; Youngstrom et al., 1999). The average BDI score for the mothers in the sample was 12.4 (sd: 9.7), and 42.5% of them scored at or above the cutoff score of 13, showing moderate depression.

3.2.3 General Information Sheet (GIS)

Demographic data was collected from the parents by a modified version of the General Information Sheet developed for the study of childhood onset depression (Kapornai et al, 2007). It is a fully structured interview with pre-coded item response choices, covering among others, demographic, family, developmental, physical health, and psychosocial history and characteristics, with the parent serving as informant. It was used as a structured interview in the depressed sample, and as a self-report questionnaire in the school sample. The self-report form is a modified version of the interview form. Years of maternal education served as a proxy for socioeconomic status.

3.2.4 Inventars zur Erfassung der Lebensqualität bei Kindern und Jugendlichen (ILK)

I have not found any Hungarian publications about the quality of life of psychiatrically ill Hungarian child population. Furthermore, there was no questionnaire available for children’s quality of life in Hungarian. Therefore, in order to investigate this issue and inter-informant agreement, first I needed to translate and validate a quality of life questionnaire for Hungarian child population. I followed the criteria set by Wallander et al. (2001) to find a test which operationalizes an accepted, clear and generic QoL definition, shows satisfactory psychometric properties, has parallel self- and proxy-reports available, includes QoL domains applicable to children, and takes into consideration the developmental stage of the child. The Inventars zur Erfassung der Lebensqualität bei Kindern und Jugendlichen (ILK) self-report questionnaire seemed to fulfil all of the above criteria (Vetró et al., 2003). The questionnaire consists of 7 items inquiring about QoL during the last week in different domains of life. It was developed by Mattejat et al. and was validated and published on German samples (Mattejat et al., 1988a; Mattejat and Remschmidt, 1988b). The ILK measures quality of life in children aged 6-18, it has child, adolescent and parent versions (Appendix B, C, D). The child version is adequate for children from 1st to 4th grades; the adolescent version is for grades 5th to 8th. The first two versions have similar wording, the parent version is identical to the adolescent one and similar in content to the child version. Scoring is on a 5-point Likert scale, 1 is the best, 5 is the worst following the German school grading system. The child version offers faces as scoring options for easier understanding. The questionnaire is simple, it takes 5-10 minutes to complete, can be read out loud to a child who is unable to read. Since it is not illness specific, it can be used for both healthy and ill (somatic and/or psychiatric) populations making comparison possible. Two additional items inquire about QoL modifying effects of the illness and its therapy.

Items of the test include the domains of school, family, peer relations, alone activities, physical health, mental health and global well-being. Evaluation is possible by the individual item scores, by a dichotom score (1 or 2: satisfied, 3-5: dissatisfied) or by a total score. The total score is calculated by adding the individual scores and subtracting the sum from 35 in order to reverse the direction of the severity of the score. Thus possible total values will fall between 0 and 28, 0 being the worst, 28 the best quality of life ratings. By using this method the total score becomes comparable to other QoL test scores.

Previous studies validated the questionnaire on German community (N=9292) and psychiatric ill (N=605) samples (Mattejat et al., 1988a; Mattejat and Remschmidt, 1988b). Internal consistency was adequate and/or moderate for the parent version (Cronbach α for the community sample was 0.76 and for the psychiatric sample was 0.66) and was moderate for the adolescent and child versions (Cronbach α :0.63 and 0.55, respectively). Test-retest reliability after 35 days was also adequate for the total score (Pearson r: 0.72), and moderate for the different domains (Pearson r: 0.64-0.49). Mother-child interrater reliability scores of the individual items and the total score were r: 0.58-0.25 and r: 0.53, respectively. ILK was compared to the Kinder Lebensqualitätsfragebogen (KINDL) scale that measures the quality of life of children and adolescents as well (Bullinger et al., 1989; Bullinger and Ravens-Sieberer, 1995; Ravens-Sieberer and Bullinger, 1998). Reliability was moderate for the total score (r: 0.65) and moderate or low for the individual items (r: 0.59-0.33). The questionnaire discriminated the community sample from the psychiatric sample based on both parental and child reports (Mattejat, ILK Manual).

Hungarian adaptation of the test was preceded by translation and back-translation. Back translation was reviewed by the original developer. The questionnaire is available on the internet in several languages (Hungarian among them) (http://www.kjp.uni-marburg.de/lq/index/php).

Mother-child agreement about QoL of children was measured by an absolute agreement score. It was computed by subtracting the child's or the adolescent's total score from the mother's total score. The absolute difference score ignores the signs of differences. Its magnitude was assessed by relating it to the maximum possible score.

3.2.5 Child Depression Inventory (CDI)

Depressive symptoms of the children in the school sample were measured by the short version of the Child Depression Inventory (CDI, Kovacs, 1992). It is a widely used self-rated questionnaire appropriate for ages 7 to 17 years. It is assumed to yield a quantified index of depressive symptom severity for the previous 2 weeks. It has been shown to be a reliable and useful method for examining children and adolescents (Larson and Melin, 1992; Allen et al., 2000). The test consists of 10 items, rated on a 0-2 point scale. Completion requires a short time. A cut-off of 9 has been suggested for clinical purposes (Poli et al., 2003; Davanzo et al., 2004). CDI has demonstrated strong correlation to other measures of depression and to related constructs such as anxiety and self-esteem.

3.3 Statistical analyses

All data were normally distributed, therefore I used parametric tests. T tests were computed to explore differences between maternal and child depression scores and differences between boys and girls. In the agreement on depressive symptoms study, preliminary univariate analyses were conducted to investigate the effect of selected variables on maternal and child reports separately and on the agreement index. Only significant interactions were included in the multivariate model. Since the results of the univariate models were redundant with those that emerged in the multivariate analyses, only the final multivariate models are reported. I used generalized linear models to investigate the effects of variables on the individual reports and agreement, and to examine possible two-way interactions between them. A backward elimination method was applied to the interaction terms such that all terms were initially included, and then terms were sequentially eliminated (starting with the one with the largest p-value) until only significant interaction terms ($p < .05$) remained in the final model.

Internal reliability of the ILK was measured by Cronbach α, inter-rater reliability by Pearson correlation, and test-retest reliability by intraclass correlation coefficient (ICC). Since other quality of life questionnaire in Hungarian was not available (there was no gold standard), the assessment of convergent validity was not possible. Discriminative validity was examined by comparing the QoL in a sample with high level of depressive symptoms and a symptom-free group. A sample of depressed children was also tested before and after cognitive-behavior therapy by the ILK among other questionnaires in order to test the effectiveness of the therapy and the sensitivity of the questionnaire. Factor analysis was also carried out.

Mother-child reliability in the QoL agreement study was measured by several methods (Pearson r coefficient, ICC, absolute difference) in order to be comparable to previous studies. The following ratings were used for comparison: <0.2 poor, 0.21-0.4 fair, 0.41-0.60 moderate, 0.61-0.80 substantial, 0.81-1.00 excellent to perfect. Absolute agreement was computed by subtracting the child's score from the mother's score. The absolute difference score ignores the signs of differences. It was used as the dependent variable in the multivariate linear model; child's age and gender, presence or absence of depressive illness, and maternal education as a proxy for SES were the independent variables. All associations were regarded significant if p was less than 0.05.

4. Results

4.1 Mother-child agreement about depressive symptoms of the child

Differences in symptom reports by informant and child sex: As shown in Table 3, mothers reported higher symptom severities for their children than children reported for themselves on the overall depressive symptom severity, as well as on the Mood and Vegetative Symptom Clusters. When I examined boys and girls separately, the same pattern of mothers' over-reporting was found for boys for the overall score, and for all three subdomains of symptoms. However, mothers' and daughters' reports of overall symptom severity were not significantly different. Furthermore, although mothers did report more severe mood symptoms than girls, girls reported more severe cognitive symptoms than did mothers. Comparing boys and girls on their self-reported symptom severity, I found that girls endorsed significantly higher levels than did boys on the Total Depressive Symptom Severity and all three Symptom Clusters.

Table 3. Total and Type-Specific Child Symptom Severity: Comparisons by Reporter and by Child Sex

Variables	Total n = 354 Mean(sd)	Boys n = 196 Mean(sd)	Girls n = 158 Mean(sd)	t-value by sex
Total Depressive Symptom Severity:				
Child Self Report	13.24 (7.19)	11.92 (7.06)	14.87 (7.03)	3.91***
Maternal Report	14.74 (6.54)	14.34 (6.42)	15.23 (6.67)	1.29
Paired t by reporter	-4.37***	-5.56***	-.60	
Mood Symptom Cluster:				
Self Report	3.27 (1.90)	3.03 (1.89)	3.70 (1.86)	3.31**
Maternal Report	4.07 (1.83)	3.95 (1.79)	4.20 (1.89)	1.27
Paired t by reporter	-7.28***	-7.21***	-3.10**	
Cognitive Symptom Cluster				
Child Self Report	4.44 (3.24)	3.81 (3.10)	5.24 (3.25)	4.21***
Maternal Report	4.62 (3.10)	4.52 (3.15)	4.75 (3.06)	0.69
Paired t by reporter	-1.41	-3.71***	2.06*	
Vegetative Symptom Cluster				
Child Self Report	5.49 (3.08)	5.11 (3.00)	5.97 (3.12)	2.60**
Maternal Report	5.97 (3.09)	5.79 (2.93)	6.21 (3.27)	1.27
Paired t by reporter	-2.79**	-3.34**	-.54	

sd: standard deviation
*p<0.05 **p<0.01 ***p<0.001.

Multivariate analyses of symptom reports and mother-child agreement: Variables that were included in the model were maternal BDI scores, maternal education, child age and child sex. Continuous predictor variables were centered prior entering them in the model and computing interaction terms (Aiken and West, 1991). First, I analyzed the effects of the variables on symptom reports of children about themselves, and mothers about their children (Table 4).

Table 4. Modeling Maternal and Child Report of Symptom Severity and Mother Child Agreement

	Overall model		Parameters for individual predictors and interaction terms: B values (SE)					
	df	F	Child sex	Child age	Mother BDI	Mother Education	Education X Child Sex	Child Age X Child Sex
Child Depressive Symptom Severity by Child's Report								
Total	(5, 300)	10.90***	2.13**	.60*	.10*	-.12	--	.81*
			(0.81)	(0.29)	(0.04)	(0.14)	--	(0.39)
Mood	(4, 300)	8.60***	.46*	.22***	.03*	-.01	--	--
			(0.22)	(0.05)	(0.01)	(0.04)	--	
Cognitive	(4, 298)	10.17***	1.25***	.38***	.02	-.01	--	--
			(0.37)	(0.09)	(0.02)	(0.06)	--	
Vegetative	(5, 295)	9.51***	.55	.14	.06***	-.09	--	.45**
			(0.35)	(0.11)	(0.02)	(0.06)	--	(0.17)
Child Depressive Symptom Severity by Mother's report								
Total	(4, 300)	6.73***	.45	.09	.19***	.14	--	--
			(0.75)	(0.18)	(0.04)	(0.13)	--	
Mood	(4, 301)	5.10***	.15	-.02	.05***	.03	--	--
			(0.22)	(0.05)	(0.01)	(0.04)	--	
Cognitive	(4, 287)	3.35*	.06	.02	.06**	.13*	--	--
			(0.37)	(0.09)	(0.02)	(0.06)	--	
Vegetative	(5, 292)	6.77***	.22	.06	.09***	.15	-.34**	--
			(0.35)	(0.08)	(0.02)	(0.08)	(0.12)	
Mother-child Agreement								
Total	(4, 273)	3.02*	-.45	.45**	-.02	.11	--	--
			(0.60)	(0.14)	(0.03)	(0.10)	--	
Mood	(4, 300)	4.54**	-.02	.19***	.00	.00	--	--
			(0.19)	(0.05)	(0.01)	(0.03)	--	
Cognitive	(4, 284)	2.24	.04	.12	-.03	.06	--	--
			(0.29)	(0.07)	(0.01)	(0.05)	--	
Vegetative	(4, 288)	1.31	-.37	.15*	.00	.04	--	--
			(0.32)	(0.08)	(0.02)	(0.05)	--	

Note. BDI: Beck Depression Inventory. SE: Standard Error. The following interaction terms were included in the initial models, but not in any of the final models: BDI X Age, BDI X Sex, Mother's Education X Child Age. *p<0.05 **p<0.01 ***p<0.001.

With the child-reported symptom severity total score as the dependent variable, the results showed that child sex, age, mother's BDI, and an Age X Sex interaction were significant predictors. Examining the effect of age separately for girls and boys showed that age significantly predicted symptom severity for girls (B = 1.39, SE = .25, $p < .001$), but not for boys (B = .44, SE = .25, p = .08).

When looking at the symptom cluster for mood symptoms, child sex, age and maternal BDI were associated with more severe children report of symptoms. For cognitive symptoms, child age and sex predicted more severe symptoms. For vegetative symptoms, maternal BDI, and an age X sex interaction emerged as significant predictors. Examining the simple effects of age separately for girls and boys again showed that age predicted symptom severity for girls (B = .54, SE = .12, $p < .001$), but not for boys (B = .07, SE = .11, p = .52).

When parent-reported symptom severity score was modeled as the dependent variable, I found that mainly parent variables were significant predictors of child symptom severity. Mothers with higher BDI scores reported more severe symptoms in their children (using either the total symptom scale, or the three symptom Clusters). Also, for Cognitive cluster, more educated mothers reported higher levels of symptoms in their children. For vegetative symptoms, an Education by Sex interaction was found. More educated mothers reported less severe vegetative symptoms for girls (B = -.18, SE = .09, $p < .05$), but mothers' education was unrelated to their reports of vegetative symptoms for boys (B = .12, SE = .07, p = .09).

I then used mother-child agreement as the dependent variable. Only child age predicted consistently the agreement score. Older children and their mothers were more likely to agree (than younger children and their mothers) on child symptom severity when examining the total symptom severity score or the Mood and Vegetative Symptom Clusters. For each year of increase in age, the concordance on the total symptom score increased by 0.46 points, on average.

4.2 Reliability and validity of the ILK questionnaire

Due to the differences in the categorization of ages in the various studies, I used the following nomenclature: children represent younger samples in the QoL agreement study from 1st to 4th grades (ages 7 to 11 years) while adolescents represent older ages from 5th to 8th grades (ages 11 to 15 years). When assessing children and adolescents together I used the nomenclature "youth".

Internal reliability: All three versions showed adequate reliability (children: Cronbach $\alpha=0.66$, adolescent: Cronbach $\alpha=0.73$, parents: Cronbach $\alpha=0.78$).

Inter-rater reliability was analyzed separately for children and their parents and adolescents and their parents in different domains of QoL. Results are in the fair-moderate range for most domains. The highest correlation is in the domain of school (Table 5).

Table 5. Parent-child and parent-adolescent correlations of the ILK

	Inter-rater correlation (Pearson r)	
	Parent-child	Parent-adolescent
School	0.414**	0.624**
Family	0.168**	0.395**
Peer relations	0.133**	0.265**
Alone activity	0.037	0.154**
Physical health	0.124**	0.353**
Mental health	0.175**	0.281**
Global QoL	0.154**	0.279**

*p<0.05, **p<0.01, ***p<0.001

Test-retest reliability of the total score was adequate for all three versions. Parent-rated forms had the highest reliability (ICC=0.77), adolescent version had somewhat lower value (ICC=0.75), the child version showed the lowest but still adequate reliability (ICC=0.67). Measuring reliability of the individual domains, ICC values were between 0.54-0.78 in parent-rated forms, between 0.57-0.71 in adolescent forms and between 0.25-0.64 in children’s questionnaires.

Quality of life of individual domains: Table 6 shows the percentage of youth satisfied and dissatisfied with their quality of life in a given domain based on the opinion of the children and the parents. Dissatisfaction about school and mental health shows an increase with the age of the child. This tendency can be observed both in self-report and proxy-report, although parents most often underestimate the difficulties compared to their children. Problems with the family are most evident in ages 13 to 15; peer relations are most difficult for younger children (6 to 9 years). Time spent alone causes concern for 41.2 % of children in the 6 to 9 year-old group. Highest dissatisfaction in ages 10-12 and 13-15 is connected to school. The greatest difference between parents and youth is in the domain of alone activities in the 6-9 year-olds and the 10-12 year-olds, while it is in domains of global quality of life and mental health in the oldest group.

When sexes were compared, the only significant difference was in the domain of school. More boys were unsatisfied with school than girls (29.9% versus 22.9%; p=0.000).

Table 6. Distribution of satisfied and dissatisfied youth in individual QoL domains by self- and proxy-reports

Quality of life		**Youth-report (N=2620)** 6-9 years	10-12 years	13-15 years	**Parent-report (N=2620)** 6-9 years	10-12 years	13-15 years
School	Satisfied (%)	79,2	74,6	63,7	88,6	76,0	67,2
	Dissatisfied (%)	20,8	25,4	36,3	11,4	24,0	32,8
Family	Satisfied (%)	93,9	95,3	90,7	99	98,1	93,9
	Dissatisfied (%)	6,1	4,7	9,3	1,0	1,9	6,1
Peer relations	Satisfied (%)	85,8	89,0	93,7	95,3	93,4	92,8
	Dissatisfied (%)	14,2	11,0	6,3	4,7	6,6	7,2
Alone activities	Satisfied (%)	58,8	75,7	83,9	93,6	90,8	90,9
	Dissatisfied (%)	41,2	24,3	16,1	6,4	9,2	9,3
Physical health	Satisfied (%)	88,8	91,9	89,6	97,4	96,3	96
	Dissatisfied (%)	11,2	8,1	10,4	2,6	3,7	4,0
Mental health	Satisfied (%)	80,7	76,4	72,3	92,7	87,9	84,1
	Dissatisfied (%)	19,3	23,6	27,7	7,3	12,1	15,9
Global QoL	Satisfied (%)	90,3	90,7	85,5	98,4	95,3	92,8
	Dissatisfied (%)	9,7	9,3	14,5	1,6	4,7	1,2

Distribution of the total scores is shown on Figures 1 and 2 separately for youth and parents. Higher total score shows better total quality of life. Since the sample was collected from the community, the distribution is skewed in the direction of higher values.

Discriminative validity: I compared QoL values in two subgroups, one consisting of youth having depressive symptoms at clinical level and another with youth free of depressive symptoms. Children and adolescents were not separated in this evaluation (Table 7). Means of total scores were significantly different in the two samples regardless of reporter. Parental mean total score of symptom-free children was 25 points (sd: 2.57), youth in this group scored 25 points (sd: 2.17) on average as well; parents of “depressed” youth showed a mean of 23 points (sd: 2.81), youth rated a mean of 20 points (sd: 3.79). There is a significant difference between the parents and youth of the two samples. Lower scores relate to worse quality of life. The difference increased when QoL of individual domains were compared. Based on the opinion of youth there are significant differences between depressed and non-depressed groups in the number of unsatisfied individuals in all domains of QoL. According to parents there are significant differences in 5 of the 7 domains.

Figure 1. Percent distribution of QoL total score based on the opinion of youth

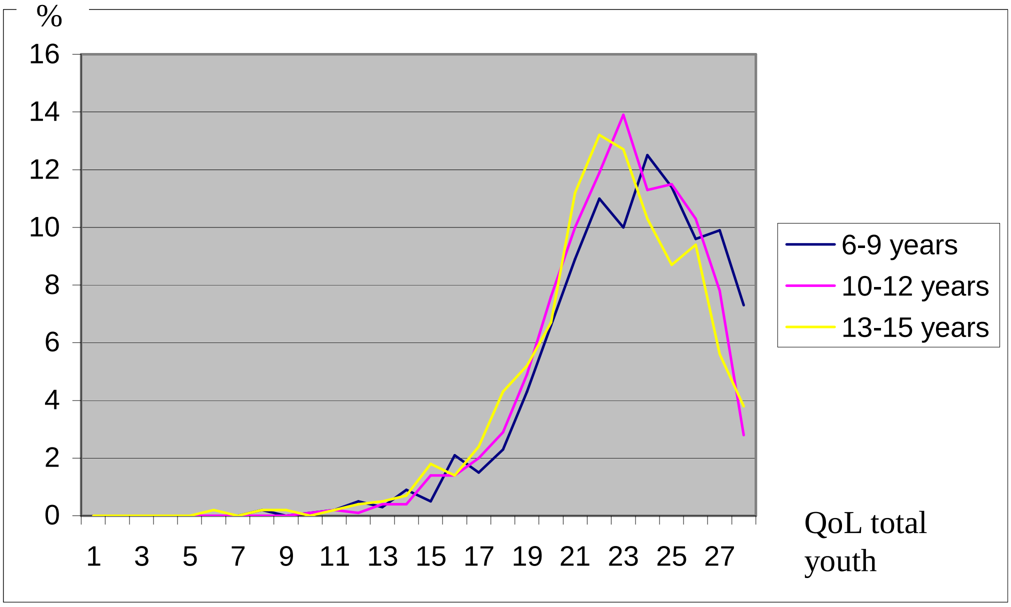
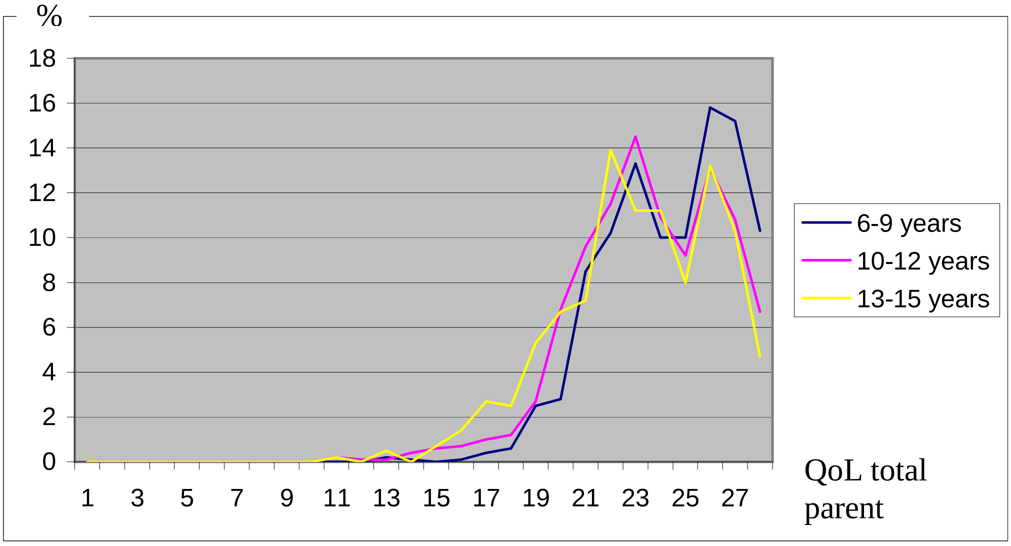


Figure 2. Percent distribution of QoL total score based on the opinion of parents



Factor analysis: QoL of the individual domains showed low correlation to each other (r=0.04-0.48 in youth report and r=0.16-0.68 in parent report). The highest Pearson r coefficients were observed between global quality of life and mental health.

Table 7. Percent of dissatisfied youth in the depressed and symptom-free groups in youth self-reports and parent proxy reports

Dissatisfied (%)	Youth report			Parent report		
	Depressed	Symptom-free	p	Depressed	Symptom-free	p
School	45.9	8.6	0.000	30.9	10.8	0.000
Family	21.7	0	0.000	4.1	0.4	0.002
Peer relations	26.3	3.6	0.000	9.8	3.2	0.001
Alone activity	33.1	18.6	0.000	7.5	6.8	0.736
Physical health	22.3	3.2	0.000	4.9	2.5	0.117
Mental health	55.3	5	0.000	17.6	5.4	0.000
Global QoL	32.9	0.7	0.000	6.5	1.8	0.002

Children and adolescent versions of the ILK together showed a 2 factor solution (Table 8). The „eigen" value of the first factor was 2.54 that of the second was 1.00; the factors together explained 50.6% of the variance. Family, physical health, mental health, and global quality of life were loaded on the first factor while QoL regarding school was only loosely connected. The second factor contained peer relations and alone activities. Items of the parental questionnaire all loaded on the same factor („eigen" value: 3.11), which explained 44.5% of the variance. This structure was the same as the one described by Mattejat in the ILK Manual.

Table 8. Factor-structure of the ILK after rotation

	Factor (youth)[a]		Factor (parent)[b]
	1	2	1
Global QoL	**0,669**	0,401	0,939
Mental health	**0,628**	0,317	0,742
Family	**0,530**	0,072	0,553
Physical health	**0,442**	0,177	0,497
School	**0,363**	0,237	0,465
Peer relations	0,154	**0,503**	0,453

Alone activities	0,087	**0,237**	0,439

Extraction Method: Maximum Likelihood. [a] Rotation Method: Varimax with Kaiser Normalization. [a] Rotation converged in 3 iterations. [b] 1 factor extracted. 5 iterations required.

Lastly, I tested the change in quality of life of depressed youth before and after cognitive-behavior therapy (CBT). The sample consisted of 3 boys and 4 girls between the ages of 12 and 15 (mean: 13.14 years, sd: 1.57 years) diagnosed with MDD by ISCA-D previous to treatment. ILK was completed before and after the CBT by the youth and the parents separately. CBT was administered according to a protocol of 11-14 sessions by learning techniques of primary and secondary control over symptoms of depression (Weisz et al., 1997). Therapy lasted for 4.5 months on average. The total score for QoL before CBT was 9.71 points (sd: 1.98), after CBT it was 12.14 points (sd: 2.12) according to the children ($p<0.054$), while it was 9 points (sd: 1.83) before CBT and 13.9 points (sd: 3.39) after CBT according to the parents ($p<0.005$). Even though these results have limited value due to the small sample size, they show a significant improvement in quality of life after recovery from depressive illness. It is also possible that the improvement of quality of life is slower than recovery from depressive symptoms as it was shown in adult studies (Demyttenaere et al., 2002).

4.3 Mother-child agreement about QoL of youth

Reliability ratings were in the moderate-substantial range for both depressed and non-depressed samples and for all raters (Cronbach alphas for depressed youth 0.713, and their mothers 0.715; for non-depressed youth 0.608, and their mothers 0.752). The mean values of quality of life scores were lower in the depressed sample than in the non-depressed one regardless of the reporter. Mothers of depressed children rated the QoL of their children significantly lower than youth themselves. Mothers of non-depressed children scored significantly higher on the QoL of their offspring than their children. The same direction of differences could be observed in most of the domains. Mothers of depressed children underestimated the well-being of children in the areas of school, family, peer relations and mental health compared to their offsprings. No difference was found in the domain of alone activities, while mothers rated better quality of life for physical health than their depressed offspring. Mothers of non-depressed children rated significantly better QoL in the domains of school, alone activity, physical and mental health while worse QoL in family life than their children. No difference was found in the areas of peer relations and global QoL (Table 9).

The multivariate regression model showed that the presence of depression in the child was the only significant variable affecting mother-child agreement about the child's quality of life. Age and gender of the child and maternal education did not have a significant effect (df=1814, F=25.988, p=0.00, R^2=0.04).

Table 9. Quality of life ratings of mothers and youth in the depressed and non-depressed samples

	Depressed sample N=248			Non-depressed sample N=1695		
	mother	children	paired t	Mother	children	Paired t
''Total	16.50	17.85	-4.29***	24.04	23.44	7.30***
'Domains of quality of life						
School	3.07	2.86	2.99**	1.89	1.95	-3.63***
Family	2.34	2.12	3.27***	1.34	1.28	3.67***
Peer relations	2.50	2.14	4.7***	1.54	1.52	0.94
Alone activity	2.13	2.25	-1.47	1.56	2.06	-16.81***
Physical health	2.05	2.23	-2.63**	1.39	1.47	-3.92***
Mental health	3.39	3.00	4.93***	1.69	1.76	-2.89**
Global QoL	3.02	2.54	6.8***	1.54	1.52	1.3

''total score ratings from 0 to 28, higher scores represent better quality of life
' domain score ratings from 1 to 5, lower ratings represent better quality of life
*p<0.05, ** p<0.01, *** p<0.001

Agreement indices of the two samples can be seen in Table 10. Pearson r correlations and ICC values showed similar associations.

Table 10. Agreement indices of the depressed and non-depressed samples

	Depressed sample N=248				Non-depressed sample N=1695			
	Pearson r	ICC	AbsDif	%*	Pearson r	ICC	AbsDif	%*
Total	.208	.206	3.98	14	.314	.314	2.6	9
School	.461	.459	0.73	18	.533	.533	0.45	11
Family	.280	.279	0.77	19	.212	.211	0.38	10
Peer relations	.222	.221	0.85	21	.187	.184	0.54	14
Alone activity	.099	.095	0.92	23	.080	.071	0.93	23

Physical health	.184	.182	0.75	19	.190	.186	0.47	12
Mental health	.127	.120	0.99	25	.202	.201	0.64	16
Global QoL	.151	.144	0.89	22	.159	.159	0.51	13

ICC: Intraclass correlation, AbsDif: Absolute difference score, mother minus child score, QoL: quality of life, *percent of maximum possible difference

Mothers' and youths' total scores correlated more closely in the non-depressed sample than in the depressed one. Moderate associations could be observed in satisfaction with school regardless of illness status. The rest of the correlations were poor to fair. The magnitude of the absolute difference was assessed by relating it to the maximum possible score. Difference between raters in the depressed sample was greater than in the non-depressed sample (3.98 or 14% versus 2.6 or 9%, respectively). Exploring individual domains in the depressed sample the highest disagreement was seen in the area of mental health and global rating of well-being. The absolute difference in the area of alone activity was the same (23%) in both samples. Besides that difference, the rest of the domains showed larger inter-rater differences in the depressed sample (range from 18% to 25%) than in the non-depressed one (range from 11% to 16%).

5. Discussion

5.1 Variables affecting mother-child reports and agreement about depressive symptoms of the child

5.1.1 Effect of child sex on individual symptom reports

A novel finding is the differential effect of child's sex on maternal reporting of offspring's symptom. Namely, I found a consistent pattern in group level comparisons for mothers to generally report higher overall levels of depressive symptoms for their sons than the sons report about themselves. However, with regard to daughters, the discordance only appeared in the area of mood symptoms, with mothers perceiving their daughters as having more mood problems than the girls themselves reported. My results are consistent with results of Frank et al. (2000) who found larger discrepancies between parents and sons than parents and daughters for questions about feelings and moods. Other studies have also found maternal over-reporting in clinical (Renouf and Kovacs, 1994) and community samples enriched for juvenile offenders (Youngstrom et al., 2000) using standardized interviews and self-report scales, but did not examine the influence of child's sex on symptom reports. Thus, I essentially confirmed my hypothesis that mothers and daughters are more likely to agree than are mothers and sons about the off-springs' depressive symptoms.

When examining the influence of sex-related interactions on symptom reports, I found three significances showing that female (but not male) sex may have a variety of effects on depressive symptoms. Namely, older girls reported more total depressive symptoms and particularly more vegetative symptoms than younger girls. The finding that age predicted more severe symptoms only for girls parallels the findings of sex difference in depression by the time of adolescence but not in childhood (Hankin et al., 1998; Ge et al., 2001; Cole et al., 2002; Kiss, 2007a). Furthermore, less educated mothers reported higher levels of vegetative symptoms for daughters. This could reflect the fact that the higher levels of overall depression (reported by girls) is more likely to be perceived by lower SES mothers in terms of observable symptoms (e.g., change of appetite or weight). But this posthoc explanation is speculative, because of the number of interaction terms tested (N = 60) and a lack of specific hypothesis.

5.1.2 Effect of maternal depression on individual symptom reports

Consistent with another one of my hypotheses, I found that higher level of maternal depression was associated with mothers reporting more severe depressive symptoms in their children. Maternal over-reporting in association with depression has been shown in many studies (e.g., Renouf and Kovacs, 1994; Briggs-Gowan et al., 1996; Chilcoat and Breslau, 1997; Najman et al., 2001). It has been debated, however, whether this effect can be explained by increased maternal sensitivity to shared symptoms or a true elevation of emotional problems in the children of symptomatically depressed mothers. As results show, children of high BDI mothers did report high levels of affective symptoms, though the effects of maternal depression on children's own reports were less strong than on mothers' ratings. Overall however, and consistent with findings in the literature (Richters, 1992; Chilcoat and Breslau, 1997; Najman et al., 2001), this general pattern of results suggests that children of more depressed mothers are at an increased risk for more severe depressive symptoms themselves.

Individual maternal or child variables seemed to have a universal effect across all depressive symptoms, whereas interactions among variables emerged mainly in regard to vegetative and mood symptom clusters for girls. Interestingly, the cognitive symptom cluster was not predicted by any interactions among the variables of interest. Given that more depressed mothers reported more symptoms for their children without differentiation among symptom clusters, and that the effect of mothers' BDI scores were not moderated by child age or sex, the impact of mothers' mood on child symptoms appears to be more global.

5.1.3 Effect of child age, sex, maternal depression, and educational level on mother-child agreement

Child age was the only variable that predicted mother-child agreement regarding the child's depressive symptoms, with improved concordance as children got older. This is in accordance with the literature on out-patients (Renouf and Kovacs, 1994) and community samples (Jensen et al., 1999). As it has been noted, some of the reasons for better agreement between adolescents and their parents are likely to include developmental increases in introspection, communication skills, and self-monitoring ability (Renouf and Kovacs, 1994; Kraemer et al., 2003). On the other hand, maternal affective psychopathology, educational level, or child sex proved to have no effect on inter-informant symptom agreement, echoing several findings from other studies (e.g., Breslau et al., 1987; Nguyen et al., 1994; Renouf and Kovacs, 1994).

My findings suggest that variables which may affect the symptom report of parents about their children and children's report about themselves are likely to overlap but are not identical with variables which may affect the extent of agreement between such informants.

5.2 Reliability and validity of the ILK questionnaire

Based on my results the Inventars zur Erfassung der Lebensqualität bei Kindern und Jugendlichen (ILK) questionnaire has adequate reliability and validity in the 7-15 year-old Hungarian population and thus it is suitable for measuring the quality of life in this age group.

I examined the reliability of the adolescent and child versions separately partly because the questions of the tests have different wording fitted to the comprehension level of the given age-group. The other reason was the assumption in the literature that self-report of younger children is less reliable than self-report of older ones (Theunissen et al., 1998; Ronen et al., 2003). Possible reasons for lower reliability include lower self-reflection (Renouf and Kovacs, 1994; Kraemer et al., 2003), worse verbalization (Theunissen et al., 1998), and weaker emotional expression abilities (Ronen et al., 2003) of younger children. Even though reliability of the child version was lower, it was still in the acceptable range.

Three weeks test-retest reliability data showed an increase with the age of the reporter. Total QoL score had better reliability than individual domains which were assessed by one question only. Even though this limits the information received about the satisfaction in the domains, we must keep in mind that quality of life is a complex concept and thus its assessment cannot be limited to one area of life only.

The ILK questionnaire significantly differentiated children showing clinical level of depressive symptoms and children free from emotional problems both by parental and youth self-reports. It was shown earlier that psychiatric disturbances, depression among them, decrease quality of life (Sawyer et al., 2002; Mayer et al., 2006). In my study the impairment in quality of life of the depressed sample was most pronounced in the domain of mental health which further supports the importance of psychiatric illness in QoL. Further investigation is needed about the short and long-term effects of psychiatric diseases on quality of life.

5.3 Variables affecting mother-child reports and agreement about QoL of children

5.3.1 Effect of reporter on individual reports of QoL

In accordance with my hypothesis, parents of depressed children rated lower quality of life overall and in most domains than their children. Parental overestimation of the negative effects of illness in quality of life compared to the child has been shown in various somatic disorders, in attention-deficit/hyperactivity (Klassen et al., 2006) and in a psychiatric outpatient population (Baastiansen et al., 2004). In Baastiansen et al.'s study patients suffering from mood disorder were included in the sample but diagnosis was based on symptom checklist. The depressed population in my study was diagnosed by a more precise semi-structured interview according to DSM IV criteria. In a study of quality of life of epileptic children Ronen et al. (2003) showed that while parents equally considered present and future concerns caused by the illness, children considered present concerns far more important than future ones. This finding might explain the differences between parents and their depressed children. On the one hand the burden of care-giving might cause parental misjudgment of the child's problems. On the other hand the child might be unable to fully comprehend the impact of illness on his or her life.

Parents of non-depressed youth rated better quality of life for their children that children for themselves. Levi and Drotar (1999) did not find significant differences between children and their parents in a healthy control group. The sample size, however, was very small which can explain the differences in their results compared to mine. In a more recent study Russel et al. (2006) found better QoL reported by parents than children in a healthy comparison sample in 8 out of 10 domains of life. Sturms et al. (2003) studied long-term QoL in 8 to 15 year-old traffic victims 2,5 years on average after the trauma. They found better parent-rated QoL for 4 out of 7 subscales, while the rest of the domains did not show significant parent-child differences. Their results can be explained by the finding that the traffic victim group differed only minimally from the community reference group in their QoL, therefore could be considered almost as healthy as the other group. My results support the tendency of parents to relate more serious negative effects to depressive disorder than their children themselves and to undervalue their non-depressed offsprings' problems compared to the children. On the one hand these findings underline the importance of parental education and guidance in chronic pediatric conditions besides the medical treatment of the child, and on the other hand the need for surveillance and prevention based on children's opinion in the community.

5.3.2 Agreement about the quality of life of children

Mother-child agreement was better in the non-depressed sample by all methods applied. This contradicts some of the previous results on QoL concordance in physically ill populations. Russel et al. (2006) compared parent-child concordance in cancer patients and normal controls. They found better correlations in the cancer groups both on and off treatment. They note, however, that the controls had a restriction in range of QoL scores; many parents and children reported the maximum value for the scale which weakened linear correlations in this group. It is also possible that a somatic condition shows more observable, better understood negative consequences and therefore more reliably grasped by the parents, while the effects of psychiatric illnesses are less straight-forward, more covert and thus less observable. This would explain why agreement is better in chronic physical illnesses and worse in psychiatric diseases compared to healthy populations while having similarly lower levels of parental QoL ratings compared to child self-reports in both conditions.

The highest agreement in both samples was in the domain of school life. It has been known to be among the most observable domains and also one about which the opinion of an outsider, the teacher, is readily available. QoL concerning school life proved to be the most highly agreed domain in other studies as well (Parsons et al., 1999; Robitail et al., 2006).

Absolute differences helped to investigate this issue further. An important finding of this study is that QoL of mental health was the most controversial domain between depressed child-mother dyads. It might even offer an explanation for the greater disagreement in the depressed sample compared to the non-depressed one, major depression being one of the most important factors influencing mental health. It was shown previously that mental health is the domain that correlates most closely to global quality of life in a community sample using the same instrument (Kiss et al., 2007/b). Satisfaction with activities and time spent alone shows similarly high disagreement in both depressed and non-depressed samples; therefore it is not specific to the depressed population.

5.3.3 Effect of child age and presence of illness on QoL agreement

Even though the effect of age on agreement was not significant in this sample, there was a tendency for increased concordance as children got older. In Robitail's study (2006) involving a European community sample agreement was higher for adolescent–parent dyads than for child–parent dyads. In the other two publications examining psychiatric samples the effect of age on agreement was not investigated (Baastiansen et al., 2004; Klassen et al., 2006). In my study the presence of depression was the only factor which considerably and significantly decreased agreement between mothers and children about QoL of children.

5.4 Limitations of the study

The lack of a "gold standard", that is an undoubtedly reliable and adequate pool of information about the illness specifics of the child is a universal limitation of the study of agreement in child psychiatry. Even if such a standard did exist, untrained informants probably use different thresholds and have different abilities, skills and judgment biases which influence their opinions. Therefore, reports of different informants must be compared to each other without exact knowledge of their validity. For this reason the study of inter-informant agreement and factors influencing it are especially important. There is a clear need to carry on the evaluation of factors related to differences in self and proxy ratings and their agreement in child psychiatry and pediatrics.

The protocols did not include a psychiatric examination of mothers, and thus I cannot readily generalize my findings to clinically diagnosed parental depression. Furthermore, I did not have information about mother's own quality of life. It has been shown in previous studies that parents' own well being influences their opinion about their child's quality of life. Specifically, parental depression (Vance et al., 2001), parental stress (Vance et al., 2001; White-Koning et al., 2007) and parental QoL (Creemens et al., 2006) were studied. However, their potential role in affecting agreement has not been certified. It would be an important extension of this study to include maternal QoL among factors influencing mother-child agreement.

Fathers were not included in the study because only a small percentage was available for questioning. It is possible that mothers are more concerned with the well-being of their children or simply have more time to accompany their children to health services. Studies have shown, however, that fathers are just as knowledgeable of their children's problems and that mother-father reports are closely correlated (Sawyer et al., 1998; Treutler and Epkins, 2003). Future research should be more conscious to include fathers as well.

5.5 Clinical relevance of agreement and disagreement issues

When choosing a target problem for therapy, disagreement between the child and the mother complicates the therapist's problem-identification task and poses a dilemma. According to the study of Hawley and Weis (2003), most therapists incorporate some of what parents report and some of what children report but with more emphasis on the parental report. The stronger therapist-parent agreement was not influenced by the child's age, parental psychopathology or therapist experience, some of which factors proved to be influencing agreement between the clients. Possible reasons for the higher concordance between therapist and parent include that therapists may believe parents are more reliable reporters than children, they may want to establish an immediate alliance with the parent to prevent drop out, or may unintentionally favor information from another adult. It is noteworthy, however, that therapists do not seem to consider possible agreement-alternating factors when choosing the target for the therapy. They should be mindful at minimum of the age of the child which is the only factor affecting agreement, and parental psychopathology which was shown to influence parental reports. If the treatment plan does not target problems most concerning to the parent and the child, motivation to participate may be threatened.

There is agreement in the literature that clinicians should obtain information from multiple informants during the assessment of child psychopathology and quality of life (Renouf and Kovacs, 1994; Bennett et al., 1997; Eiser and Morse, 2001; Jokovic et al., 2004; Klassen et al., 2006) in order to increase the validity of the resultant diagnosis. According to the situational specificity argument, different informants provide valid information about functioning in different contexts (Reynoulds and Kamphaus, 1992; Achenbach, 1995; Youngstrom et al., 2000). Therefore, the question is not about which informant is more accurate but rather about how to interpret and combine information from multiple sources.

Kraemer et al. (2003) suggested the use of at least three informants in clinical evaluations who give independent, valid but not redundant reports. Furthermore, researchers must consider the dimensions which represent the response of an informant about the subject's characteristics over a relevant span of time. These are the following: trait dimension - the characteristic of the subject (symptom) under investigation (ie. problematic behavior of the child), context dimension - factors related to place and circumstances that influences the subject's expression of the trait, perspective dimension - characteristics of the informant that influence his or her assessment of the trait, and the error of measurement. An example would be to obtain child, parent and teacher reports about behavioral problems of the child. In this case, the trait dimension is the same (behavioral problems of the child), context dimension is represented by home versus school, and perspective dimension is represented by self versus parent versus teacher. It is not the number of informants that matters; it is also how informants are selected. The lack of correlation between informants, that is to date considered problematic, thus becomes the phenomenon facilitating a more valid measure.

Cole et al. (2002) showed in their research that agreement was stronger about symptom development over time than about the level of depressive symptoms at any specific point in time. Therefore, they suggest the addition of a temporal dimension to multi-informant assessment systems.

5.6 Importance and novelty of study

A systematic, large sample study of inter-informant agreement in a depressed child psychiatric population was not carried out before in Hungary. Such a sample size offers a unique opportunity to study mother-child concordance of individual symptoms and clusters of depressive symptoms. Previously, there was confusion in the literature about the effect of child age, gender and parental psychopathology on individual reports and mother-child agreement. My results show that reporter characteristics mainly influence individual reports while child age and health status affects agreement between them. Interaction among variables modifying mother-child agreement was rarely studied before. Research on this subject promises guidance to clinicians in the everyday practice to assemble information from different sources while being knowledgeable of factors modifying individual reports and agreement among informants.

This study fills a gap in our knowledge because literature is scarce in examining parent-child agreement about QoL of children in psychiatric populations. There were no such studies on young depressed patients before. Furthermore, comparison of agreement about the QoL of psychiatric ill versus healthy children was not reported previously. Since this disorder has an increasing prevalence into adolescence with long term impairment and continuity into adulthood, it is important to study the quality of life reported by different raters and its different aspects in this population.

Through the course of this research I validated a measure of quality of life of children applicable in healthy and ill populations which was not available in Hungarian previously. There is no published data on the quality of life of Hungarian psychiatric child population. Based on the results of the present research depression significantly lowers the quality of life of the sufferers, and decreases agreement between parents and children about the difficulties they have. Subjective QoL as one of the possible outcome measures offers the possibility to follow the (un)satisfaction of the child and the parent and compare it among various somatic and psychiatric illnesses. Ideally, such information might even have an impact on the distribution of resources.

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