

Quality of life in newly diagnosed children with specific learning disabilities (SpLD) and differences from typically developing children: a study of child and parent reports

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Abstract

Introduction Research on quality of life (QoL) of school children with specific learning disabilities (SpLD) and their parents is scarce. The present study explores QoL deficits in newly diagnosed children with SpLD and their parents, in comparison to a similar age group of typically developing children. Possible associations between parental and child QoL were statistically explored in both groups of children.

Methods 70 newly diagnosed children with SpLD [International Classification of Diseases-10 (ICD-10) criteria] (38 boys, 32 girls, mean age 10.1 years) and a control group of 69 typically developing children of the same age (40 boys, 29 girls, mean age 10.6 years) were recruited. Children were of normal intelligence quotient, attending mainstream schools. Their parents were also recruited so a child's scores could be associated with corresponding parental scores (mother or father). Children's QoL was assessed by the German questionnaire for measuring quality of life in children and adolescents (KINDL^R) questionnaire and parental QoL by World Health Organization Quality of Life brief questionnaire (WHOQOL-BREF) of the World Health Organization.

Results Children with SpLD in comparison to typically developing children reported according to the KINDL^R measurement poorer *emotional well-being*, lower *self-esteem* and satisfaction in their relationships with *family* and *friends*. Surprisingly, *school functioning* was not reported by these children as an area of concern. Parents of children with SpLD indicated experiencing lower satisfaction in the WHOQOL-BREF domains of *social relationships* and *environment*. Correlational and regression analysis with parental-child QoL scores provided evidence that in the SpLD group, parental scores on WHOQOL-BREF *social relationships* and *psychological health* domains could be predictors of the child's *emotional well-being*, satisfaction with *family*, *friends* and *school functioning*. Stepwise regression analysis verified the effect of parents' WHOQOL-BREF *social relationships* domain on several dimensions of children's KINDL^R QoL.

Conclusions The results may suggest certain significant effects of the SpLD condition on newly diagnosed children's QoL. Emotional and social deficits seem to be experienced by this cohort of children and their parents. Investigation into the possible interrelationships between parental and child QoL seems to indicate that parental social wellbeing may to a certain extent influence some dimensions of the child's QoL. The findings are useful for policy making and specialized interventions for children with SpLD and their families.

Keywords

parental QoL, quality of life, specific learning disabilities, typically school children

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Introduction

Quality of life (QoL) has been mainly investigated in heterogeneous and mixed disability groups of children, as in the case of children with attention deficit hyperactivity disorder, with conduct disorders or with various emotional, psychiatric or physical disorders (Sawyer *et al.* 2002; Edwards *et al.* 2003; Bastiaansen *et al.* 2004; Marsac *et al.* 2006). It is worth noticing that the issue of QoL in children with specific learning disabilities (SpLD) has not been investigated that is children with intelligence quotient (IQ) scores within the normal range, attending regular schools, but presenting with *specific difficulties* in one or more academic areas, e.g. reading, spelling or in arithmetical skills, as indicated in the International Classification of Diseases-10 (ICD-10) diagnostic system (The ICD-10 Classification of Mental and Behavioral Disorders 2007).

There is definitely a lack of evidence with regards to how children with SpLD perceive their own QoL and more specifically whether or not they experience deficits in certain areas. Some studies have used parental proxy reports (Bastiaansen *et al.* 2004; Karande *et al.* 2009a). In addition, there are few studies investigating the QoL of parents with children with SpLD. And furthermore, control groups comparisons for either parents or children are not available (Karande & Kulkarni 2009; Karande *et al.* 2009b). In a recent study investigating the degree of QoL agreement between child and parent proxy reports [using corresponding forms of the German questionnaire for measuring quality of life in children and adolescents (KINDL^R) questionnaire], children with SpLD were found to perceive several dimensions of their QoL in a different way to their parents (Rotsika *et al.* 2011). Specifically, children officially diagnosed with SpLD, who were bound to experience several difficulties in their learning and overall achievement in school, appeared to have an unexpected positive evaluation of their *everyday functioning in school* (as measured by the relevant dimension of the KINDL^R questionnaire). In contrast, their mothers appeared to project a rather negative evaluation on their children's academic well-being (Rotsika *et al.* 2011).

Besides children's QoL, another area concerns parental QoL that is investigation on how parents of children with SpLD experience and report on their QoL. In a recent study, mothers of children with SpLD have reported experiencing significantly poorer *psychological health* and *social relationships* (Karande & Kulkarni 2009). Gender seems to also have an impact as parents with a male child with SpLD reported experiencing limited energy, enthusiasm and endurance to perform the daily living activities (Karande & Kulkarni 2009). With regards to mental health, parents seem to be affected as 75% of mothers of chil-

dren with SpLD were having mild anxiety as measured by the Hamilton Scale (Karande *et al.* 2009b). So, it is important to investigate whether or not parental and child QoL in groups with SpLD may possibly influence each other.

It is noticed that the QoL of parents has been investigated in several groups of parents with disabled children. So, parents of children with pervasive developmental disorders have reported lower QoL in several World Health Organization Quality of Life brief questionnaire (WHOQOL-BREF) facets and domains, such as *physical activity*, *social relationships*, as well as in *overall QoL and health* (Mugno *et al.* 2007). Furthermore, parents of children with Down syndrome or autism have also reported lower QoL in the *psychological* domain and in *physical and mental health* (Buzatto & Beresin 2008; Lee *et al.* 2009). Mothers of children with various mental disorders also, reported poorer QoL indicating higher prevalence of psychopathology (Guðmundsson & Tómasson 2002).

In overall, it seems that investigation regarding interrelations between child and parent QoL have produced evidence that children with mental and/or physical disabilities experience a lower QoL which, in turn, may affect their parents' well-being (Bode *et al.* 2000). In this study, parental QoL has been reported as significantly lower while children's deficits in self-reported social integration and emotional stability could be good predictors of their parents' QoL.

It is thus argued that limited attention has been given to the systematic investigation of parent-child QoL intercorrelations or the issue of parents' QoL possibly affecting their child's QoL and vice versa. Including this kind of investigation in clinical groups of children could be very useful, considering that the study of bilateral aspects in parent-child QoL might facilitate a holistic understanding of the interplay between the child's diagnosis and the parents' well-being. Findings of related studies indicate that parental subjective mental health status significantly correlates with their typically developing adolescents' self-reported scores on *physical and psychological well-being*, *mood and emotions*, *parent-child relationships*, *school environment* and *financial resources* (Giannakopoulos *et al.* 2009). Depression among UK parents with children with cancer was reflected in children's poorer QoL, indicating an association as well as the possible impact of parental mental health on ill children's self-perceived QoL (Vance *et al.* 2001).

Few studies provide evidence on the QoL of families with disabled children, among which are studies on children with psychiatric disorders such as Asperger's or Down's syndrome (Dyson 1997; Hedov *et al.* 2000; Allik *et al.* 2006). The studies on the QoL of parents and families with children with SpLD are even scarcer (Karande & Kulkarni 2009; Karande *et al.* 2009b).

Parental QoL and the interplay with the QoL of the child' with SpLD remain to be addressed.

Therefore, the need to investigate the QoL profiles of parents and children with SpLD has been established. These are children with normal IQ attending mainstream schools who are diagnosed with SpLD, and they must be distinguished from other groups of children with learning disabilities, such as children with mental retardation, wherein there is already evidence of a poorer QoL (Watson & Keith 2002).

The present study attempts to explore QoL differences between children with SpLD and a control group of typically developing children of the same age and area, aiming to identify QoL domains which might be affected in the target population in question. QoL differences are similarly investigated in their parents and in a comparison group of parents of typically developing children. In addition, possible correlations between parental and child QoL are statistically explored, addressing the predictive value of parental QoL for the child's QoL.

Method

Sample

The target group included 70 children officially diagnosed with SpLD (38 boys, 32 girls) with a mean age of 10.1 years (SD 2.2 years). The control group consisted of 69 typically developing children (40 boys, 29 girls), with a mean age of 10.6 years (SD 2.8 years). All participating children were of normal IQ attending mainstream schools. Parental groups included 70 and 69 participating mothers or fathers respectively.

Children with SpLD referred through schools, were recruited at an Outpatient Mental Health and Educational Centre (OMHEC), specializing in the diagnosis and treatment of SpLD, located in the centre of the city. Diagnosis of SpLD was based on ICD-10 criteria (F 81.0 and F 81.1 specified in the manual as *Specific reading disorder* and *Specific spelling disorder*), and IQ assessment with the use of Wechsler Intelligence Scale for Children-III (WISC-III). Children were recruited if they had no previous visits at the Centre. The assessment of each child took place over two appointments lasting approximately 3 h. The participating cases represented 85% of the total number of children given the SpLD diagnosis during the time of the study. Children from immigrant families and those aged 14 and above were excluded from the study. Refusals were only one case.

The children's control group included typically developing children, who were native speakers and recruited from a central public school of the same area, constituting a convenience sample. Criteria of selection required children in both control

and target groups to be similar in age, percentage of gender participation and educational grade. Parents and teachers of typically developing children were asked to report on children's health; so the participating children in the control group reported no disability or health problems. Consent was given by the parents and refusals were 1.5% approximately.

Approval for the study was obtained from the Pedagogical Institute operating under the Ministry of Education, the scientific committee of the Department of Psychiatry, the participating OMHEC, as well as the administration of the participating school. Informed written consent was obtained from parents and verbal consent from children.

Procedure

Group A (children with SpLD)

Upon arrival to the OMHEC, an information sheet and a consent form were given to the parent and the child. The questionnaires were completed prior to the child's scheduled diagnostic assessment by each child and the accompanying parent (the majority of which were mothers), seated however in different rooms.

Group B (typically developing children)

The parent questionnaires were sent home via the child's school, together with the consent form. After returning the parents' consent form, children were able to complete the questionnaires at school.

Measures

In all cases participants' socio-demographic data were collected including children's age and gender and parents' age, gender, years of education, marital status and occupation.

Child's QoL was assessed by the KINDL^R questionnaire (Ravens-Sieberer & Bullinger 2000; Vidali *et al.* 2001; Ravens-Sieberer *et al.* 2008). This self-report instrument was developed specifically to assess QoL in children and adolescents, referring to the present and recent past. It consists of 24 items answered on a 5-point Likert scale (never, seldom, sometimes, often, all the times). The items comprise the following six dimensions: *physical well-being*, *emotional well-being*, *self-esteem*, *family*, *friends* and *everyday school functioning*. The questionnaire is available in three age-specific versions (The Kiddy-KINDL^R for 4–7 years old, the Kid-KINDL^R for 8–12 years old and the

Kiddo-KINDL^R for 13–16 years old). Higher scores indicate better QoL. Reliability and validity values have been confirmed (Ravens-Sieberer *et al.* 2008).

Reliability of the language version of the KINDL^R instrument used in the present study, was calculated with Cronbach's α coefficients in a sample of 540 typically developing children and adolescents by Rotsika and colleagues (2011) and were found to exceed the acceptable minimum of 0.7, ranging from 0.71 to 0.90 for children aged 13 years or more and from 0.70 to 0.80 for children aged below 13 years (Rotsika *et al.* 2011).

Parental QoL was assessed by the WHOQOL-BREF, a short version of WHOQOL-100, a generic self-report instrument developed by the World Health Organization (The WHOQOL Group 1998). The language version of WHOQOL-100 has been validated presenting satisfactory validity and reliability values (Ginieri-Coccosis *et al.* 2009).

The WHOQOL-BREF consists of 26 items, 24 of which are grouped under the following four domains providing 4 independent scores: (1) *physical health*; (2) *psychological health*; (3) *social relationships*; and (4) *environment*. In addition, there is a separate Facet with two items assessing overall QoL and condition of health (*overall QoL/health*). All items are rated on a 5-point Likert scale. A higher domain score indicates better QoL in the specific domain. The version used contains four additional national items referring to satisfaction with (1) *nutrition*; (2) *work*; (3) *home life*; and (4) *social life*, which were added at the end of the administration form and have been incorporated in the existing four domains on the basis of the results of confirmatory factor analysis. Analyses have revealed that the WHOQOL-BREF version has satisfactory psychometric properties (Ginieri-Coccosis *et al.* 2012; Appendix I).

Statistical analysis

Data sets were analysed using SPSS. A two-way ANOVA analysis was used to investigate differences between the target (SpLD) and the control groups of children and parents. Correlational analysis was performed in order to examine possible associations between parents' and children's QoL, for both groups. Models of regression analysis were performed using children's QoL scores as dependent variables and their parents' QoL domain scores as independent variables. Regression models were run separately for target and control groups.

Results

Table 1 shows the socio-demographic characteristics of all participating children and their parents. Target and control chil-

Table 1. Demographic characteristics of SpLD and comparison group of children and their parents

Children	SpLD (n = 70)	Control (n = 69)
Age		
Mean (SD)	10.1 (2.24)	10.6 (2.77)
Gender		
Boys (n)	38 (54.3%)	40 (58%)
Girls (n)	32 (45.7%)	29 (42%)
Parents	SpLD (n = 70)	Control (n = 69)
Age		
Mean (SD)	38.1 (3.84)	37.9 (5.84)
Gender		
Men	11 (15.7%)	21 (30.4%)
Women	59 (84.3%)	48 (69.6%)
Marital status		
Single	7 (10.0%)	0 (0%)
Married	54 (77.1%)	65 (94.2%)
Divorced	9 (12.9%)	4 (5.8%)
Years of education (years)		
Mean (SD) for mothers	11.22 (3.27)	12.25 (3.17)
Mean (SD) for fathers	13.5 (3.53)	12.6 (3.54)
Occupation		
Publics sector	9 (12.9%)	18 (26.1%)
Private sector	26 (37.1%)	13 (18.8%)
Self-employed	11 (15.7%)	12 (17.4%)
Homemaker	23 (32.9%)	24 (34.8%)
Unknown values	1 (1.4%)	2 (2.9%)

SpLD, specific learning disabilities.

dren were found to be similar in terms of age (10.1 and 10.6 years respectively) and gender mix (38 boys/32 girls and 40 boys/29 girls respectively). The corresponding groups of parents were also similar in terms of age (38.1 and 37.9 years respectively). Differences were observed in the years of education, with mothers in the SpLD group having completed approximately 2 years less than fathers of the same group, and 1 year less than the mothers of control children. The majority of parents in both groups were married, but there were more divorced and single parents among parents of children with SpLD.

Significant differences were observed between the two groups of children across the four KINDL^R dimensions, indicating a higher level of QoL for the control group of typically developing children in the dimensions of *emotional well-being*, *self-esteem*, *family* and *friends*. No differences between groups were found in the dimensions of *physical well-being* [$F(1,138) = 0.39$, NS] and *school functioning* [$F(1,138) = 0.73$, NS] (see Table 2). Also, no significant KINDL^R mean score differences were found with regards to gender. Finally, there was no interaction effect found between group and gender for any of the KINDL^R dimensions.

Significant differences were also observed between the two groups of parents on the WHOQOL-BREF domains. So, parents of the control group of children reported significantly higher

Table 2. KINDL^R mean score differences between SpLD children and the control group

KINDL ^R dimensions	SpLD group (n = 70)	Control group (n = 69)	F	P
	Mean (SD)	Mean (SD)		
Physical well-being	78.92 (13.69)	80.43 (14.77)	0.39	0.53
Emotional well-being	75.59 (16.30)	80.57 (10.93)	4.47	0.04*
Self-esteem	59.64 (18.30)	69.32 (15.32)	11.41	0.001**
Family	70.85 (15.83)	76.87 (13.92)	5.58	0.02*
Friends	75.45 (18.29)	81.44 (15.79)	4.27	0.04*
School functioning	65.92 (16.29)	68.04 (12.66)	0.73	0.39

*P < 0.05, **P < 0.001.

KINDL^R, German questionnaire for measuring quality of life in children and adolescents; SpLD, specific learning disabilities.**Table 3.** WHOQOL-BREF domains mean score differences between parents of SpLD children and parents of the control group

WHOQOL-BREF domains	SpLD group (n = 70)	Control group (n = 69)	F	P
	Mean (SD)	Mean (SD)		
Physical health	52.95 (11.45)	55.22 (9.59)	1.60	0.21
Psychological health	60.95 (9.38)	63.93 (9.11)	3.59	0.06
Social relationships	66.13 (17.54)	74.33 (14.81)	8.86	0.00**
Environment	53.03 (10.85)	58.56 (13.96)	6.79	0.01*
Overall QoL/health	72.14 (14.30)	72.83 (16.17)	0.07	0.79

*P < 0.05, **P < 0.001.

QoL, quality of life; SpLD, specific learning disabilities; WHOQOL-BREF, World Health Organization Quality of Life brief questionnaire.

Table 4. Correlations between parental WHOQOL-BREF domain mean scores (n = 70) and child's KINDL^R dimension mean scores for the SpLD group of children (n = 70) (Pearson's correlation coefficient)

WHOQOL domains	KINDL ^R dimensions					
	Physical	Emotional	Self-esteem	Family	Friends	School
Physical health	0.23	0.14	0.20	0.02	0.17	0.72
Psychological health	0.09	0.08	0.05	-0.02	-0.03	0.24
Social relationships	0.19	0.23	0.12	0.26*	0.28*	0.29*
Environment	0.02	-0.14	0.05	0.08	-0.03	-0.02
Overall QoL/health	0.12	-0.05	0.06	0.09	0.14	0.15

*P < 0.05.

KINDL^R, German questionnaire for measuring quality of life in children and adolescents; QoL, quality of life; SpLD, specific learning disabilities; WHOQOL-BREF, World Health Organization Quality of Life brief questionnaire.

scores in WHOQOL-BREF *social relationships* and *environment* domains but no differences were found in the domains of *physical* and *psychological health* or in the facet of *overall QoL/health* (see Table 3).

Next, correlational analyses were conducted using Pearson's *r* coefficient in order to investigate the relationship between parental and child QoL. Correlation coefficients between 0.1 and 0.3 are considered low, between 0.31 and 0.5 moderate and over 0.5 high. A small number of low correlations were found between parents' and their children's QoL. The study sample provides >90% power which is sufficient to detect a moderate correlation ($r > 0.30$) at the 0.05 level of significance. Therefore, the results definitely do not reflect random findings.

Thus, in children with SpLD and their parents, low positive significant correlations were found only between parental scores on the WHOQOL-BREF *social relationships* domain and their children's KINDL^R scores in the dimensions of *family*, *friends* and *school functioning* (see Table 4). In the control group, there was only one significant correlation between parental scores on the WHOQOL-BREF *social relationships* domain and children's QoL dimension of *self-esteem* (see Table 5).

In addition, regression analysis was conducted with the child's KINDL^R dimension scores as dependent variables and their parents' WHOQOL-BREF domain scores as independent variables (see Table 6). The results were similar to those of the correlational analysis indicating few statistically significant relationships between these

WHOQOL domains	KINDL ^R dimensions					
	Physical	Emotional	Self-esteem	Family	Friends	School
Physical health	0.10	-0.06	0.05	-0.02	-0.10	-0.12
Psychological health	-0.03	-0.12	0.06	-0.12	0.06	-0.13
Social relationships	0.06	0.03	0.29*	-0.01	0.13	0.17
Environment	0.07	-0.14	-0.08	-0.15	-0.09	-0.19
Overall QoL/health	0.14	0.04	0.16	-0.11	0.14	0.15

* $P < 0.05$.

KINDL^R, German questionnaire for measuring quality of life in children and adolescents; QoL, quality of life; SpLD, specific learning disabilities; WHOQOL-BREF, World Health Organization Quality of Life brief questionnaire.

Table 6. Simple regression analysis: parental WHOQOL-BREF domain scores predicting SpLD children's KINDL^R dimensions scores

Dependent QoL variables	Independent variables	Beta	t	P-value
Physical	Physical	0.23	1.90	
	Psychological	0.09	0.75	
	Social	0.12	0.98	
	Environment	0.02	0.20	
	Overall QoL	0.12	1.02	
Emotional	Physical	0.14	1.19	
	Psychological	0.08	0.67	
	Social	0.23	1.93	0.06*
	Environment	-0.14	-1.18	
	Overall QoL	-0.05	-0.39	
Self-esteem	Physical	0.20	1.64	
	Psychological	0.05	0.38	
	Social	0.12	0.97	
	Environment	0.05	0.39	
	Overall QoL	0.06	0.48	
Family	Physical	0.02	0.14	
	Psychological	-0.02	-0.18	
	Social	0.26	2.26	0.03**
	Environment	0.08	0.63	
	Overall QoL	0.09	0.72	
Friends	Physical	0.17	1.41	
	Psychological	-0.03	-0.24	
	Social	0.28	2.37	0.02**
	Environment	-0.03	-0.24	
	Overall QoL	0.14	1.14	
School functioning	Physical	0.07	-0.60	
	Psychological	0.24	1.99	0.05**
	Social	0.28	2.45	0.02**
	Environment	-0.02	-0.14	
	Overall QoL	0.15	1.26	

* <0.10 , ** <0.05 , *** <0.01 .

KINDL^R, German questionnaire for measuring quality of life in children and adolescents; QoL, quality of life; SpLD, specific learning disabilities; WHOQOL-BREF, World Health Organization Quality of Life brief questionnaire.

variables. So, in the target group, the parents' *social relationships* domain scores were found to correlate with their children's KINDL^R *emotional well-being*, *family*, *friends* and *school functioning* dimension scores. The latter dimension of child's QoL was also

Table 5. Correlations between parental WHOQOL-BREF domain mean scores ($n = 69$) and child's KINDL^R dimension mean scores for the control group of children ($n = 69$) (Pearson's correlation coefficient)

found to be associated with parents' WHOQOL-BREF *psychological health* domain (see Table 6).

In the control group, there was only one significant correlation between the typically developing children's *self-esteem* KINDL^R scores and their parents' WHOQOL *social relationships* scores.

In addition, stepwise regression analysis was conducted on the SpLD group of child-parent participants using variables, which turned out to confirm that the WHOQOL-BREF domain of parental *social relationships* could be a significant predictor of the child's QoL in three dimensions: (1) *family*; (2) *friends*; and (3) *everyday school functioning*. Specifically, for the *family* dimension, the values were: Beta = 0.26, $t = 2.25$ and $P < 0.03$; for the *friends* dimension: Beta = 0.28, $t = 2.37$ and $P < 0.02$; and for the *school* dimension, the values were: Beta = 0.29, $t = 2.45$ and $P < 0.02$.

Discussion

Quality of life in children with SpLD has rarely been the focus of investigation, especially involving children's and parents' QoL reports. The present study aims to document children's own assessment of their QoL and investigate differences with a control group. A similar aim pertains to the parents of these groups of children. Also, the study includes the statistical exploration of relationships between children's and their parents' QoL. In this study, we assessed child and parent QoL, when the child was referred by the school to be examined for SpLD and before been told the results of examination and the diagnosis.

Our results show that compared with a control group of typically developing children of the same age, children with SpLD reported experiencing poorer *emotional well-being* and *self-esteem* and a higher level of dissatisfaction with their relationships with *family* and *friends*. These results may suggest that at the time we conducted QoL assessment, these children already suffered stigmatizing effects because of encountering ongoing difficulties in their school performance, rather than this being a

recent effect because of the child's referral to a specialized diagnostic centre for SpLD. The present findings indicating children of the SpLD group experiencing lower *self-esteem* and poorer *emotional well-being* are in agreement with those of another study reporting that children with SpLD had a number of psychological problems such as low self-concept (26%), anxiety (31%), depression (19%), anger (21%) and disruptive behaviour (21%) (Michopoulou *et al.* 2003). Also, results from a study using parents' assessment of children's QoL, indicated that several areas of children's QoL were reported as most likely to present deficits namely *emotional, family, social, behavioural* and *physical functioning* (Karande *et al.* 2009a).

Regarding our results on children's QoL, it is worth noting that contrary to our expectation that lower QoL would be reported by children with SpLD in the relevant problem area, specifically the dimension reflecting the child's academic well-being, it was found that the evaluation reported by these children in the respective dimension of *everyday school functioning* was not lower or different from that reported by the control children; so there was no indication of reduced QoL in the dimension that normally is expected to suffer because of the child's learning disability. A possible explanation could be that these children may underestimate or deny the problem in question so as to protect themselves from distressing feelings regarding their performance and functioning in school. On the other hand, it could be argued that children with SpLD may become adjusted to their academic difficulties and may not experience deficits or distressing feelings about their school life and functioning. Whatever the case, if negative evaluations experienced by children with SpLD cannot be acknowledged and clarified, they may cause emotional damage to the child's self-image before they can be addressed and modified. Measurement of QoL at different age points may help children with SpLD become aware of unrecognized areas of concern regarding their academic well-being. QoL assessment needs to correspond to the child's developing emotional and cognitive capacity, and it may complement psychological and educational or clinical testing.

Examining the QoL of parents of children with SpLD and comparing it to parents of typically developing children, the present findings suggest that parents experience poorer QoL in the domains of *social relationships* and *environment* as measured by the WHOQOL-BREF instrument. Differences can be identified across items comprising these two domains. So, deficits in the *social relationships* domain may refer to poorer personal and sexual relationships, lack of social support and poorer social and home life (see Appendix I). Also, deficits in the *environment* domain may include: home and environmental conditions, security and safety, opportunities for recreation,

availability of transportation and resources for acquiring new skills, financial capacity, as well as availability and quality of health services (see Appendix I). It should be taken into account that these facets of QoL are measured by one item per facet in the WHOQOL-BREF instrument, so interpretation of results is more reliable on the domain level and not on each separate facet. So, our results on the QoL of parents with children with SpLD concern mainly reduced social and environmental well-being, which seems to be in agreement with other studies reporting poorer social well-being and mental health (Karande & Kulkarni 2009; Karande *et al.* 2009b).

Performing correlational analysis between children's and parents' QoL, our results provide some low significant associations between parental QoL and children's QoL. So, in the index group, parental satisfaction with *social relationships* appeared to correlate with children's satisfaction with *family, friends* and *school functioning* (Table 4). Parents' QoL appears to bear some predictive value on children's QoL, considering that parental self-reported dissatisfaction with *social relationships* and to a lesser degree in *psychological well-being* seem to relate negatively with children's self-assessed *emotional well-being* and could possibly influence in a pessimistic way children's evaluations regarding relationships with *family* and *friends*, and *everyday school functioning* (Table 6).

Regarding the control group, very few correlations between parent and child QoL were found, specifically only the *social relationships* domain of parental QoL was found to produce some correlations with children's QoL. It could be suggested that in the control group of typically developing children, this relationship may be limited and only specific parental factors may have an effect on children's QoL, that is parental satisfaction with *social relationships* may just have a good effect on the child's *self-esteem* (Table 7). On the other hand, a more extended relationship seems to be present in the SpLD group, involving several QoL dimensions (Table 6).

Thus, an interplay between parental and child QoL may be of a different type and at a different degree in the two groups of the study. In the case of children with SpLD, more areas of children's QoL and well-being seem to become affected particularly by parental social well-being, that is parents' dissatisfaction with their own psychological and social life may be reflected to their children's dissatisfaction in social and psychological dimensions. Can such findings suggest that the members of families with children with SpLD may be more likely to influence each other in how they perceive and experience certain vital areas of their QoL? Furthermore, can these findings suggest that in typically developing children, a higher level of parental satisfaction with social well-being may affect in a positive way children's

Table 7. Simple regression analysis: parental WHOQOL-BREF domain scores predicting control group children's KINDL^R dimension scores

Dependent QoL variables	Independent variables	Beta	t	P-value
Physical	Physical	0.10	0.84	
	Psychological	-0.03	-0.27	
	Social	0.06	0.47	
	Environment	0.07	0.61	
	Overall QoL	0.14	1.18	
Emotional	Physical	-0.06	-0.47	
	Psychological	-0.12	-0.99	
	Social	0.03	0.27	
	Environment	-0.14	-1.14	
	Overall QoL	0.04	0.32	
Self-esteem	Physical	0.05	0.38	
	Psychological	0.06	0.49	
	Social	0.29	2.46	0.02**
	Environment	-0.08	-0.66	
	Overall QoL	0.16	1.32	
Family	Physical	-0.02	-0.20	
	Psychological	-0.12	-0.96	
	Social	-0.01	-0.05	
	Environment	-0.15	-1.27	
	Overall QoL	-0.11	-0.88	
Friends	Physical	-0.01	-0.82	
	Psychological	0.06	0.53	
	Social	0.13	1.08	
	Environment	-0.09	-0.75	
	Overall QoL	0.14	1.12	
School	Physical	-0.12	-0.95	
	Psychological	-0.13	-1.11	
	Social	0.17	1.42	
	Environment	-0.19	-1.59	
	Overall QoL	0.15	1.28	

**<0.05.

KINDL^R, German questionnaire for measuring quality of life in children and adolescents; QoL, quality of life; WHOQOL-BREF, World Health Organization Quality of Life brief questionnaire.

self-esteem? If so, it could be hypothesized that in healthy families parents' satisfaction with their social well-being may incorporate their own self-esteem and such a process may constitute a factor of positive influence on their children's self-esteem, as children tend to identify with their parents. Within this context, it could be possible to consider that reduced self-assessed social domain QoL in the SpLD group of parents may become reflected in complications in the child's identification with the parents leading thus to negative perceptions of self and others, – considering the lower scores in the KINDL^R dimensions of *friends*, *family*, *school life*. It seems that future investigation would benefit from including siblings and if possible all members of the families with SpLD children as to examine hypotheses regarding the parent–child relationship or the parental functioning within SpLD groups and explore its effects on children's well-being. These are questions that could be

addressed within the context of research designs combining qualitative and quantitative methodologies.

A final point to be made concerns the impact of SpLD on families and children within a specific cultural and educational context. Compared with mental retardation or other mental disabilities, it can be assumed that SpLD do not seem to cause major psychosocial impairment to the child and should not become a heavy emotional and social burden for the parents. However, academic achievement among healthy children attending mainstream schools might be highly valued in several cultural settings, and it can thus become a source of distress or external pressure for children and parents, as it is the case – we believe – for the participating families with children with SpLD. A socio-cultural pressure on academic achievement, along with long standing difficulties in learning may constitute a very distressing condition for both children with SpLD and their parents. Information and specialized services either within schools or in the community are not systematically available and in many countries including the present case, there is a lack of awareness regarding the particular needs of this group of children and their families. To appreciate the scale of the problem, one could take into account that in Greece alone there are approximately 320 000 children affected by SpLD, who are attending mainstream primary schools (Anagnostopoulos *et al.* 2000a,b). Issues highlighted above may also prove valuable to community or governmental initiatives for developing the relevant infrastructure to address the needs of these families.

Limitations

Regarding limitations of this study, the main points concern the sample size of the target group and the non-representativeness of the control group, as it was a convenience group of typically developing children. It is suggested to extend the study with samples from other regions of the country in order to enhance the value of the findings. Also, there were a low number of male participants, as women formed the majority in both parental groups. In future studies it would be important to investigate male parents and explore the impact of parental gender. A final remark concerns the use of multiple comparisons in the statistical analysis, which in a small sample could raise the chance of finding spurious positive relationships, so results need to be interpreted with caution.

Implications for research, policy and practice

It should be noted that in the specific cultural context, mothers tend to become greatly involved with their children's school

work and well-being in general. This was demonstrated further as the majority of participating children with SpLD had been accompanied by their mothers to the Outpatient Health and Educational Unit. Promoting equal participation of fathers could be beneficial for families. It is worth adding that the findings of the present study may help us identify QoL deficits in these children, as well as recognize parental needs for social support within the community or through school counselling. It would be also useful to investigate QoL in the siblings of the child with SpLD and explore possible infiltration phenomena across members of the whole family. Providing empowering interventions to families with children with SpLD may prove beneficial for parents, i.e. to claim specialized services and come to terms with the specific difficulties in the child's functioning and its multiple implications for the members' well-being. Parents may be enabled to help their children to build on strengths and develop appropriate skills and coping mechanisms.

Key messages

- Lower level of QoL in children with SpLD was found in the KINDL^R dimensions of *emotional well-being, self-esteem, family and friends*.
- Parents of children with SpLD reported lower QoL on WHOQOL-BREF *social relationships* and *environment* domains.
- In children with SpLD, low positive significant correlations were found between parental WHOQOL-BREF *social relationships* domain and their children's KINDL^R dimensions of *emotional well-being, family, friends* and *school functioning*.
- In typically developing children, only one low positive significant correlation was found between parental satisfaction in *social relationships* and their children's *self-esteem*.
- Proposal to enhance parents' social well-being as a means of affecting children's self-esteem and emotional and social well-being.
- Proposal to provide access to mental health promotion programmes for families with SpLD children.

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Appendix I

WHOQOL-BREF version with four new national items* (total 30 items): Domains/Facets/Items

Domains	Facets	Items
	Overall quality of life/general health	1. How would you rate your quality of life? 2. How satisfied are you with your health?
Physical health	Pain & discomfort	3. To what extent do you feel that physical pain prevents you from doing what you need to do?
	Energy & fatigue	4. Do you have enough energy for everyday life?
	Sleep & rest	5. How satisfied are you with your sleep?
	Mobility	6. How well are you able to get around?
	Activities of daily living	7. How satisfied are you with your ability to perform your daily living activities?
	Dependence on medication or treatment	8. How much do you need any medical treatment to function in your daily life?
	Working capacity	9. How satisfied are you with your capacity for work?
	Nutrition	*N1. How healthy do you think is your nutrition?
	Satisfaction with work	*N4. To what extent are you satisfied with your job or any type of work you do?
Psychological health	Positive feelings	10. How much do you enjoy life?
	Thinking, learning, memory & concentration	11. How well are you able to concentrate?
	Self-esteem	12. How satisfied are you with yourself?
	Body image & appearance	13. Are you able to accept your bodily appearance?
	Negative feelings	14. How often do you have negative feelings such as blue mood, despair, anxiety, depression?
	Spirituality/religion/personal beliefs	15. To what extent do you feel your life is meaningful?
Social relationships	Personal relationships	16. How satisfied are you with your personal relationships?
	Social support	17. How satisfied are you with the support you get from your friends?
	Sexual activity	18. How satisfied are you with your sex life?
	Social life	*N2. How satisfied are you with your functioning in social roles and in social activities in general?
	Home life	*N3. How satisfied are you with your home life?
Environment	Physical safety & security	19. How safe do you feel in your daily life?
	Home environment	20. How satisfied are you with the conditions of your living place?
	Financial resources	21. Do you have enough money to meet your needs?
	Health & social care: availability & quality	22. How satisfied are you with your access to health services?
	Opportunities for acquiring new information & skills	23. How available to you is the information that you need in your day-to-day life?
	Participation in & opportunities for recreation and leisure	24. To what extent do you have the opportunity for leisure activities?
	Physical environment	25. How healthy is your physical environment?
	Transport	26. How satisfied are you with your transport?

WHOQOL-BREF, World Health Organization Quality of Life brief questionnaire.

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