

---

## HEALTH-RELATED QUALITY OF LIFE IN CHILDREN AND ADOLESCENTS AND ASSOCIATED FACTORS

---

Tania GASPAR<sup>\*1</sup>, Margarida GASPARG MATOS<sup>1</sup>, Ribeiro PAIS<sup>2</sup>,  
Luís JOSÉ<sup>2</sup>, Isabel LEAL<sup>3</sup>, Aristides FERREIRA<sup>4</sup>

---

<sup>1</sup> Universidade Técnica de Lisboa & Universidade Nova de Lisboa, Portugal

<sup>2</sup> Universidade do Porto, Porto, Portugal

<sup>3</sup> Instituto Superior de Psicologia Aplicada, Lisboa, Portugal

<sup>4</sup> Universidade do Minho, Braga, Portugal

---

### Abstract

The main objective of this study was to propose a model, which includes personal and social factors associated to health-related quality of Life (HRQoL) in children and in adolescents.

A sample of 3195 children and adolescents was randomly selected from 5<sup>th</sup> and 7<sup>th</sup> graders, in Portuguese public schools. The Portuguese versions of *KIDSCREEN-52*, *Harter's SPPS*, *LOT-R*, *SSSS* and *HBSC* (selected items) were used to evaluate personal and social factors and health behaviors.

Various structural equation models were developed in association with gender, age, socioeconomic status (SES) and using the global sample. The studied models presented good adjustment indexes, which suggest a good fit for the hypothesized model.

The psychosocial variables have a strong impact in the HRQoL. Consequently, health promotion programs for children and adolescents should include the psychosocial approach. Based on our results, we discuss and propose strategies to develop HRQoL in children and adolescents, in schools and in families.

**Keywords:** health –related quality of life, children, adolescents

The most widely cited definition of Quality of Life (QoL) is provided by the World Health Organization (WHOQoL group), which defines QoL as the individual's physical health, psychological well-being, independence level, social relationships and relationship with their environment and social context, and it is seen as a "self-perception", a personal perception of individuals' own life in their specific cultural context and value systems; and related with their goals, expectations, values and perspectives (WHOQOL, 1994,1995;1996; 1998a; 1998b).

---

\* Correspondence concerning this article should be addressed to:  
E-mail: Taniagaspar@fmh.utl.p

Health-related quality of life (HRQoL) is generally conceptualized as a multidimensional construct encompassing domains such as psychological, mental, social and spiritual areas of life (Eiser & Morse, 2001). HRQoL can be viewed as a psychological construct which describes the physical, mental, social, psychological and functional aspects of well-being and function (Ravens et al. 2005).

The Well-being and health-related quality of life (HRQoL) in children and in adolescents is a quite recent concept and is a concern amongst health professionals (Koot, 2002). This must be considered within an ecological perspective, including multiple levels of analysis, namely self-perceptions and family perceptions (Harding, 2001). Children's perceptions of their HRQoL are influenced by several factors such as gender, age, personal and family characteristics, as well as their socio economic status (Caldera & Hart, 2004).

Studies focusing on children's subjective well-being include interactions between demographics (e.g. age, gender and socio economic status), interpersonal characteristics (Self Perceptions, Psychological Well-being, Mood and Emotions) and perception of well-being and happiness (McCullough, Huebner & Laughlin, 2000). Clear differences between gender, age and socioeconomic status can be found in the HRQoL of children and adolescents. For instance, according to previous Kidscreen surveys in other countries, girls' perception of health-related quality of life is inferior in all dimensions with the exception of "Social Support and Peers", "School Environment" and "Social Acceptance and Bullying". Adolescents (aged 12 to 16) presented an inferior perception of HRQoL in all measures except in the "Financial Resources" and "Social Acceptance and Bullying"; low SES perception of HRQoL is also inferior in all dimensions on behalf of children and adolescents (Bisegger et al. 2005; The KIDSCREEN Group Europe, 2006; Ravens-Sieberer et al.; 2005; Rueden et al. 2006).

The socioeconomic status has a deep impact on HRQoL, and is often associated to low academic background on the parents' behalf, interpersonal conflict, low socioeconomic status and ethnic minorities (Chen, Matthews & Boyce, 2002; STEP/BIT, 2003). According to the presented literature, and based on an ecological approach, we expect that all health aspects, such as, physical aspects, psychological aspects, social aspects and health behavior related aspects, influence several HRQoL dimensions in children and adolescents.

The main objective of this paper is therefore, to propose a theoretical model about psychological and psychosocial factors associated to HRQoL in children and in adolescents.

## **Methods**

### *Participants*

Sampling methods were derived from the international study of Health Behavior School-Aged Children, by enlarging the HBSC sample through a

selection of randomly chosen 5<sup>th</sup> and 7<sup>th</sup> grade classes from national schools (Currie, Samdal, Boyce, & Smith, 2001; Matos et al. 2006a). To be more specific, the study combines a random national representative sample of 5<sup>th</sup> and 7<sup>th</sup> grade students in a cross sectional national analysis (Matos et al, 2006b). Schools were stratified by National Educational Regions (5 in the entire country).

The study involved 95 schools and 162 classes. The sample of 3195 children and adolescents from the 5<sup>th</sup> (48.8%) and 7<sup>th</sup> grades (51.2%), were on average aged 11.8; SD 1.46, ranging from 10 to 16 (41.1% between 10.11 years of age and 58.9% 12 years of age or older); 95.3% of our participants were aged 10 to 14. The sample included 49.2 % boys and 50.8 % girls. The majority of students came from a low socioeconomic status (62.2%), and 3% were not Portuguese - these students were immigrants from African countries and from Brazil. To assess SES, a Portuguese 6-level scale (1, high; 5, low; 6 unspecified) was used. We dichotomized levels 1, 2, 3 as medium/high SES and levels 4 and 5 as low SES. KIDSCREEN questionnaires were applied in a classroom setting, after the random selection of schools and classes. The questionnaires were filled in anonymously and voluntarily to ensure that all ethical issues were met including informed consent from parents.

#### *Measures*

1- KIDSCREEN-52 (Portuguese version, Gaspar & Matos, 2008; Matos et al., 2006) – This instrument includes ten dimensions which describe quality of life related with health (Ravens-Sieberer & European Kidscreen Group, 2001; Bisegger, et al 2005). It is a self-response questionnaire for children and adolescents between the ages of 8 and 18, as well as for these individuals' parents. It assesses health issues and chronic illness and it takes an average of 10 to 15 minutes to fill in. The Portuguese translation and validation has the following internal consistency coefficients (Cronbach's Alpha): (1) Physical Well-being (5 items)  $\alpha = .77$ ; (2) Psychological Well-being (6 items)  $\alpha = .84$  (3) Mood and Emotions (7 items)  $\alpha = .86$ ; (4) Self-perception (5 items)  $\alpha = .60$ ; (5) Autonomy (5 items)  $\alpha = .81$ ; (6) Parent Relation & Home Life (6 items)  $\alpha = .84$ ; (7) Financial Resources (3 items)  $\alpha = .88$ ; (8) Social Support and Peers (6 items)  $\alpha = .84$ ; (9) School Environment (6 items)  $\alpha = .84$ ; and (10) Bullying (3 items)  $\alpha = .75$  (Gaspar & Matos, 2008; Gaspar, Matos, Ribeiro & Leal, 2005; 2006).

2- The Self Perception Profile for Children (SPPC– Harter, 1985) was translated into Portuguese and adapted to the Portuguese population (Martins, Peixoto, Mata & Monteiro, 1995). This scale is composed of 36 items organized into six subscales: Academic Competence; Social Acceptance; Athletic Competency; Physical Aspect; Behavioral Attitude; and Global Self-esteem. The first five sub-scales are related to competency self-perception and the last is associated with a self-esteem subscale. Each subscale consists of six items, and each item is scored on a four-point scale (1 indicates low competency perception while 4 reflects a high competency perception). A mean score for each subscale is

then computed resulting in six total scores which allow the tracing of an individual's profile. Questions 1, 2 and 6 are reverse-scored. The Portuguese version with the highest internal consistency for the Global self-esteem subscale ( $\alpha = .80$ ) was adapted by Gaspar (2009), and was used in the present study.

3- The Life Orientation - Revised Test (LOT-R - Scheier, Carver & Bridges, 1994) is a self-report instrument which is composed of ten items, four of which are distracters and six of which evaluate dispositional optimism. Responses are presented on a five-point ordinal scale and range from "I totally agree" to "I totally disagree". Respondents are required to indicate their agreement in relation to each statement. The Life Orientation - Revised Test was translated and adapted for children and adolescents by Gaspar (2009) with an internal consistency of  $\alpha = .59$ .

4- The Satisfaction with Social Support Scale (SSSS – Ribeiro, 1999) measures satisfaction with social support and was developed for the young adults and adults in situations of illness as well as chronic and psychological disease (Patrão, Maroco & Leal, 2006; Ribeiro, 1999). In constructing this scale, a group of health-related and well-being dimensions were considered along with other directly related dimensions. The original SSSS is composed of 15 affirmative sentences that are displayed for self-report. Subjects are required to indicate degree to which they agree with each statement on a five-point Likert scale, ranging from "I totally agree" to "I totally disagree". These 15 items are distributed on four dimensions or factors which are empirically generated to measure the following aspects related to Social Support Satisfaction: "Satisfaction with Friendship", "Intimacy", "Family Satisfaction", and "Social Activity" (Ribeiro, 1999).

The Satisfaction with Social Support Scale was translated and adapted for children and adolescents by Gaspar (2009) with an internal consistency of  $\alpha = .77$ .

The Health Behavior School-Aged Children Scale (Currie et al, 2001; Matos et al 2006a) was developed based on a WHO international study (41 countries were involved in 2006), which provided items to evaluate health behaviors in children and adolescents. In the present study, 17 of these questions were used from the total scale. These items were related to social and demographic issues, as well as with physical activity, leisure activities, drug and alcohol use, family context and relations, academic context and involvement (friends, teachers and violence), dieting and body image, and perception of happiness.

#### *Procedure*

The instrument was applied by the Social Adventure Project Research Team, based on the protocol and procedure used in the Health Behavior School-Aged Children study implemented on a national random sample of 5<sup>th</sup> and 7<sup>th</sup> graders (Currie, et al, 2001; Matos et al, 2006). The Ministry of Education, the National Commission for Data Protection and a Commission on Ethics

collaborated and expressed a favorable opinion in relation to this study. Once this authorization was conceded, various national schools were randomly chosen to participate in this study, based on the representativity of each region.

All of the schools were contacted by telephone to confirm their availability and willingness to participate in this research project. The questionnaires and fill-in instructions were sent to each school and the first were applied by teachers in a classroom context. Parent's informed consent was obtained and parents were requested to fill in a parallel form of KIDSCREEN 52, specific for parents, which is not analyzed in this particular paper. The teachers received instructions related with the application of the instrument. Once these questionnaires were voluntarily and anonymously filled in by the previously chosen classes, the questionnaires were returned by mail to the research team for data processing. Considering some of the questionnaires weren't fully completed, we decided to eliminate them from the results.

## **Results**

Variables were analyzed by gender, age and socioeconomic status. The correlations between instruments were examined and a Structural Equation Model was built.

Table 1 shows a comparison between boys and girls in terms of perceptions related to quality of health. Significant differences were found in most of the dimensions, boys presenting higher scores than girls, except in the "School Environment" dimension. No gender differences were observed on the "Social Support and Peers" dimension either.

As for the relation between the two age groups (children aged 10 and 11, and adolescents aged 12 or more) in terms of their quality of health, we found significant differences in all of the dimensions. The children group had higher scores than the adolescent group, except for the "Bullying", where adolescents had higher scores.

In terms of the Socioeconomic Status variable (SES), significant differences were found concerning quality of health in most dimensions except for the "Autonomy" dimension.

As for the SES variable, significant differences were found in most of the dimensions regarding "Self perceptions" related to health and quality of life. Nonetheless, these results were not verified in the "Autonomy" dimension. Moreover, individuals with medium/high SES presented higher values than individuals with low SES.

Comparisons by gender, age and SES concerning general self-esteem, indicated significant differences for all the variables. To be more specific, boys had higher values than girls, children aged 10 to 11 had higher values than adolescents aged 12 and up, and participants in the medium/high SES group

*Articles Section*

presented higher values in relation to general self-esteem than students with low SES.

**Table 1.** Means and standard deviations and ANOVAs – Portuguese children and adolescents HRQOL – Gender and Age comparisons – Children and Adolescents version (n= 3195)

	Gender				F	Age				F	SES				F
	Male		Female			Aged 10 – 11		Aged 12 /up			Med/highSES		Low SES		
	M	sd	M	sd		M	sd	M	sd		M	sd	M	sd	
Physical Well-being	75.64	16.69	67.93	17.59	154.49***	72.75	17.17	70.94	17.83	7.84**	73.81	16.96	70.57	17.41	16.00***
Psychological Well-being	81.14	16.45	79.06	17.22	11.89***	83.01	15.09	78.02	17.74	67.35***	81.95	15.00	80.01	16.96	6.50*
Mood and Emotions	78.52	18.66	75.29	19.57	21.60***	80.39	17.58	74.40	19.88	72.77***	79.78	16.46	76.38	19.71	14.96***
Self-Perception	76.07	17.14	71.25	18.90	54.94***	78.66	17.03	70.13	18.19	172.66***	74.90	17.97	73.13	18.19	4.35**
Autonomy	78.75	20.39	74.21	21.26	35.92***	79.43	19.46	74.41	21.70	43.22***	76.13	19.18	77.06	21.28	(n.s.)
Parent Relation and Home Life	81.70	18.61	78.55	20.84	19.56***	83.75	17.08	77.55	21.19	74.65***	82.76	17.42	80.11	20.14	8.69**
Financial Resources	74.13	27.44	74.29	26.87	(n.s.)	74.47	27.22	74.03	27.10	(n.s.)	80.69	23.79	73.43	27.02	35.79***
Social Support and Peers	77.15	19.77	76.93	19.70	(n.s.)	78.40	18.78	76.09	20.32	10.16***	78.52	17.60	76.70	20.11	4.03*
School Environment	67.00	21.63	72.17	18.18	51.97***	77.22	17.52	64.27	20.10	346.64***	72.46	18.41	69.63	19.96	9.68**
Bullying	81.11	21.54	78.89	22.49	8.00***	78.23	22.13	81.21	21.92	14.00***	83.69	18.68	79.17	22.26	21.46***
Global self-esteem	16.88	3.16	16.17	3.55	22.20***	17.24	3.00	16.00	3.55	65.07***	16.93	3.37	16.54	3.29	4.28*
Optimism	21.18	3.65	20.63	3.65	17.52***	21.11	3.56	20.75	3.72	7.00**	21.51	3.93	20.79	3.47	17.34***
Social support satisfaction	42.93	7.01	43.26	7.13	(n.s.)	43.63	6.83	42.74	7.21	11.37**	44.49	7.47	42.80	6.73	25.26***
Health-related behavior	58.61	7.51	57.67	6.83	9.16**	57.72	7.16	58.38	7.17	4.33*	59.52	6.65	57.46	7.09	29.35***

\*p<.05; \*\*p<.01; \*\*\*p<.001

Comparisons by gender, age and SES concerning life orientation (optimism and pessimism) indicated significant differences for all variables, with boys presenting higher values than girls, children aged 10 to 11 higher values than adolescents aged 12 and up, and participants with medium/high SES displaying higher values than students with low SES.

A similar comparison in relation to global social support satisfaction yielded significant differences for the gender and SES variables, with children (10 to 11) reporting higher values than adolescents (aged 12 and up), and participants with medium/high SES presenting higher scores than students with low SES. No significant gender differences were observed.

A comparison by gender, age and SES regarding health-related behavior indicated significant differences were for most of the variables, with boys reporting higher values than girls, adolescents (ages 12 and up) presenting higher

values than children (aged 10 to 11), and participants with medium/high SES reporting higher values in relation to health-related behavior than students with low SES.

**Table 2.** Pearson Correlations between the KIDSCREEN – 52 dimensions and the complementary scales (global self-esteem scale, life orientation scale, social support satisfaction scale and health-related behavior scale).

	a1	A2	a3	a4	a5	a6	a7	A8	a9	a10	b	c	d
KIDSCREEN (Dimensions)													
Physical Well-being	-----												
Psychological Well-being	<b>.54**</b>	-----											
Mood and Emotions	<b>.36**</b>	<b>.63**</b>	-----										
Self-Perception	<b>.29**</b>	<b>.44**</b>	<b>.50**</b>	-----									
Autonomy	<b>.43**</b>	<b>.56**</b>	<b>.48**</b>	<b>.39**</b>	-----								
Parent Relation and Home Life	<b>.33**</b>	<b>.56**</b>	<b>.50**</b>	<b>.43**</b>	<b>.53**</b>	-----							
Financial Resources	<b>.28**</b>	<b>.35**</b>	<b>.32**</b>	<b>.27**</b>	<b>.44**</b>	<b>.45**</b>	-----						
Social Support and Peers	<b>.39**</b>	<b>.49**</b>	<b>.42**</b>	<b>.33**</b>	<b>.57**</b>	<b>.44**</b>	<b>.48**</b>	-----					
School Environment	<b>.27**</b>	<b>.48**</b>	<b>.43**</b>	<b>.34**</b>	<b>.37**</b>	<b>.44**</b>	<b>.29**</b>	<b>.37**</b>	-----				
Bullying	<b>.22**</b>	<b>.27**</b>	<b>.41**</b>	<b>.33**</b>	<b>.24**</b>	<b>.24**</b>	<b>.30**</b>	<b>.33**</b>	<b>.14**</b>	-----			
complementary scales													
Global self-esteem	<b>.35**</b>	<b>.55**</b>	<b>.55**</b>	<b>.55**</b>	<b>.42**</b>	<b>.52**</b>	<b>.35**</b>	<b>.39**</b>	<b>.40**</b>	<b>.32**</b>	-----		
Optimism	<b>.28**</b>	<b>.36**</b>	<b>.41**</b>	<b>.30**</b>	<b>.24**</b>	<b>.32**</b>	<b>.23**</b>	<b>.26**</b>	<b>.27**</b>	<b>.23**</b>	<b>.44**</b>	-----	
Social support satisfaction	<b>.30**</b>	<b>.41**</b>	<b>.44**</b>	<b>.37**</b>	<b>.42**</b>	<b>.45**</b>	<b>.38**</b>	<b>.50**</b>	<b>.31**</b>	<b>.34**</b>	<b>.50**</b>	<b>.44**</b>	-----
Health-related behavior	<b>.35**</b>	<b>.31**</b>	<b>.26**</b>	<b>.14**</b>	<b>.28**</b>	<b>.29**</b>	<b>.30**</b>	<b>.37**</b>	<b>.30**</b>	<b>.21**</b>	<b>.25**</b>	<b>.22**</b>	<b>.32**</b>

\*\*p<.01

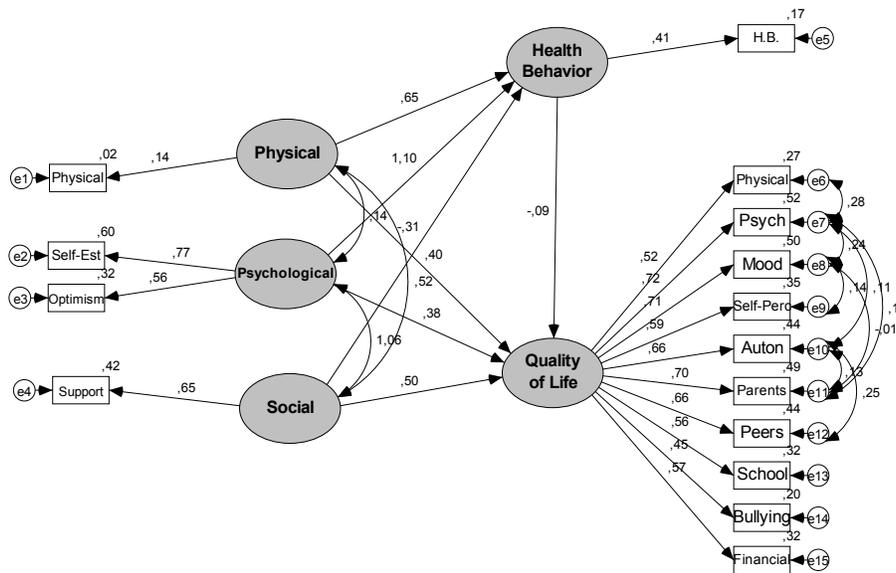
The correlation analysis results show that all of the scales are highly correlated (p<.01). Some of the highest correlations (r> .50) include “Psychological Well-being”, “Mood and Emotions” and the Global Self-Esteem. On the other hand, lower correlations were found amongst the following variables: “Bullying”; “Financial Resources” and health-related behavior.

Following this correlation analysis, the maximum likelihood method of the Lisrel 8.3 Structural Equation Modeling (SEM) program was used (Joreskog & Sorbom, 1996). The maximum likelihood estimation procedure is known to be robust against deviation from normality (Byrne, 1998). In this analysis, we tried to test seven models for seven different samples in relation to gender, age and SES. As a first model, a model containing all the participants of the study was tested. Before testing the model, the assumptions related to univariate and multivariate normality of data were examined and all variables

presented a distribution under or close to the standard normal curve for  $Z = \pm 1.96$  (Fleming & Nellis, 2000).

In our model, three independent latent variables were specified – Physical, Psychological and Social and two dependent latent variables were measured: Health behavior and Quality of Life.

Scale scores were used as observation indicators to build latent variables.



**Figure 1.** Standardized Structural Model of the relations between Physical, Psychological and Social health, Health related behavior and Health-related Quality of life

The integrative model presented in Figure 1 is composed of various components: (1) health-related quality of life (HRQoL), compiled of the ten dimensions of the KIDSCREEN-52; (2) health behavior, compiled of the four factors of the health behavior scale, (3) variables related to physical health (health status – presence or absence of chronic illness); (4) variables related to social health (global social support satisfaction); (5) variables related to psychological health (global self-esteem scale and life orientation scale).

The analysis involved an estimation of paths amongst variables. Also, the overall fit was assessed by using the following indices of fit: qui-square ( $\chi^2$ ), root mean square error of approximation (RMSEA), normative fit index (NFI),

comparative fit index (CFI), incremental fit index (IFI) and Akaike's information criterion (AIC).

A non-significant qui-square value indicates that the two matrices are not statistically different and that the data fits the model (Schumacker & Lomax, 1996). AIC is used in the comparison of two or more models with smaller values representing a better fit of the hypothesized model and NFI, CFI and IFI values close to 1 indicate a very good fit (Bentler, 1999). Finally, the smaller the RMR is, the better, and a value of 0 indicates a perfect fit. Values of RMSEA equal or less than .10 indicate a good fit (Browne & Cudeck, 1993).

**Table 3.** Estimation values (standardized) and adjustment indices for each of the studied samples

	Model 1 Global (N=3195)	Model 2 Female (N=1622)	Model 3 Male (N=1573)	Model 4 10-11 years old (N=1314)	Model 5 >11 years old (N=1881)	Model 6 Low SES (N=1235)	Model 7 High SES (N=752)
$\gamma_{2.1}$ (Physical to QoL)	.399	-.014	.841	-.042	-.547	.214	.546
$\gamma_{2.2}$ (Psychological to QoL)	.376	-.275	.636	-.272	-1.291	.287	-.002
$\gamma_{2.3}$ (Social to QoL)	.504	.399	.522	.486	.547	.511	.624
$\gamma_{1.1}$ (Physical to Health B.)	.654	.089	.580	.148	.368	-2.888	.342
$\gamma_{1.2}$ (Psychological to Health B.)	1.098	1.589	.528	-2.172	.644	-22.290	-2.333
$\gamma_{1.3}$ (Social to Health B.)	-.310	-.360	.186	3.026	.169	23.466	2.865
$\beta_{2.1}$ (Health Behavior to QoL)	-.091	.622	-.599	.784	1.942	.110	.414
Adjustment Indexes							
$\chi^2_{square}$	.02	986.31	1286.76	534.15	1216.20	.01	.01
<i>df</i>	59	59	59	59	59	59	59
Fit Indexes							
<i>RMSEA</i>	.075	.083	.075	.070	.076	.076	.077
<i>AIC</i>	1535.321	1055.452	864.777	673.819	1016.802	738.008	533.627
<i>NFI</i>	.908	.886	.900	.912	.902	.899	.889
<i>CFI</i>	.913	.894	.909	.922	.909	.909	.906
<i>IFI</i>	.913	.895	.910	.923	.909	.910	.907

As shown in Table 3, our models present RMSEA indexes which were lower or equal to .08. Similarly, adjustment levels for the CFI, NFI and IFI vary above or around .90, which suggests a good adjustment for the hypothesized model. On the other hand, the qui-square was significant for all the models. According to Schumacker and Lomax (1996), the qui-square has a tendency to indicate a significant probability as the sample size increases (normally above 200 subjects).

All of the models we tested seem to possess reasonable adjustment indexes in accordance with values recommended in the literature. Nevertheless, model 2 (female subjects) is the least adjusted (RMSEA = .083; NFI = .886; CFI = .894; IFI = .895). Also, the last two SES models present adjustment indexes which are close to the suggested parameters. The analysis of the general model (Figure 1) referring to the total sample reveals that in the relation between latent variables, the social dimensions show a greater association ( $\gamma = .504$ ) with the quality of life in children and adolescents. This social variable interferes negatively in terms of health-related behavior ( $\gamma = -.310$ ). As for the relation between observed and latent variables, self-esteem showed the highest contribution ( $\lambda_x = .77$ ) to the psychological dimension. Moreover, out of the ten measures of the Kidscreen, the psychological variables ( $\lambda_y = .72$ ), such as, “Humor and Emotions” ( $\lambda_y = .71$ ) and “Parent Relation and Home Life” ( $\lambda_y = .70$ ) present a higher association with the latent dimension of quality of life. A comparison between models 2 and 3 reveals interesting aspects which differentiate the behavior of the two genders. To be more specific, we verified that there is a greater contribution from the self-esteem variable ( $\lambda_x = .75$ ) in females. Furthermore, we confirmed that in males there was a higher impact of the physical ( $\gamma = .841$ ) and psychological ( $\gamma = .636$ ) aspects of quality of life, and of the social latent variable in terms of health-related behavior ( $\gamma = .186$ ). Although these variable present positive associations in the male sample, they show negative values in model 2, which corresponds to the female sample.

We also conducted a comparison between models 4 and 5 in order to analyze invariance in the two age groups. In this particular case, we observed that there was a negative impact of the psychological variable in terms of health-related behavior ( $\gamma = -2.17$ ) in the sample composed of younger subjects. This variable shows a positive association with health-related variables in older participants ( $\gamma = .64$ ).

Finally, models 6 and 7 focus on the invariance in terms of the two samples with different SES. In this case the physical latent variable negatively influences health-related behavior in individuals with low SES ( $\gamma = -.2.89$ ). In addition a positive structural coefficient was identified in model 7, corresponding to the high SES ( $\gamma = .34$ ). In all models, except for model 6 (low SES), we confirmed a positive impact of the physical variable on health-related behavior in children (aged 10 to 11) and adolescents. Concerning the psychological variable, we noticed a negative association emerge in model 4 (children aged 10 to 11) and in models 6 and 7, which correspond to low and high SES. As for the variable associated to the social dimension, we verified that it has equally important implications in health-related behavior, except in the general mode l ( $\gamma = -.31$ ) and in the model relating to female subjects ( $\gamma = -.36$ ). Moreover, we confirmed that health-related behavior has a negative impact on quality of life in terms of the first model ( $\gamma = -.09$ ) and in male subjects ( $\gamma = -.59$ ).

## Discussion

The results of this study highlight the importance of psychosocial variables for HRQoL. Various studies emphasize the fundamental impact of social and psychological factors in subjective well-being and in the subjective perception of quality of life. Nonetheless, social and psychological variables profoundly affect other areas of competency namely, cognitive, emotional and behavioral competencies, as well as expectations and motivation (Cummins, 2005; Gaspar et al, 2006).

The correlation analysis results showed that all scales are significantly correlated ( $p < .01$ ). Our results also confirm the complex and multidimensional character of HRQoL. They underlie the fact that HRQoL is related with physical aspects, such as health, individual aspects such as self-esteem, optimism, positive and negative emotions, self-perception and autonomy, and social aspects, such as social support satisfaction, family relation, school, peers and health-related behavior. These results are confirmed by different authors (Bronfenbrenner, 2005; Cummins, 2005; Gaspar & Matos, 2008; Harding, 2001; Matos et al, 2006b; Ravens-Sieberer et al, 2005 WHOQoL, 1996).

The model integrates physical, psychological, social and behavioral factors, and its association with the health-related dimensions of the HRQoL from the KIDSCREEN-52 was evaluated. This model confirms an ecological perspective in which psychosocial development is influenced by individual and contextual factors, such as, self characteristics, social and economical status, family type, parental style, parental stress and life experience (Bronfenbrenner, 2005). Consequently, socio-economic disadvantages, social isolation, poor life conditions, mono-parental families, interpersonal violence and conflicts between family members, parent psychopathology, high levels of stress and the lack of social support are generally associated with child behavioral problems.

The quality of life concept is related with all of the well-being aspects of the individual – physical, psychological, social and environmental. It is primarily a multi-dimensional and subjective concept (Harding, 2001). Moreover, quality of life is associated with present and past experiences (Wallander & Schmitt, 2001), as well as future preoccupations and expectations (Cummins, 2005; WHOQOL, 1996).

Generally, it was verified that boys, younger children and participants with higher SES have a more positive perception of their health-related quality of life at various levels. As for gender differences, girls presented a less positive perception of their HRQoL, except in relation to satisfaction with school, colleagues, teachers and learning abilities. No gender differences were observed in terms of peer relations (i.e., quality of the relation), support and trust of the peer group, and the satisfaction with financial resources. Our results are similar to those reported by other authors, except for the “Bullying” dimension, where others report a more positive perception of girls. In which “School Environment” is

concerned, these authors maintain that there are no differences between the two genders (Bisegger et al, 2005; Haugland et al. 2001; Simeoni et al, 2000; Topolski et al. 2001).

The two age groups compared in this study were the 10 to 11 year old group (children) and the 12 year old and over group (adolescents); there were significant differences on most of the dimensions related to perceived HRQoL. These results were not observed with regard to “Financial Resources”. The children’s group displayed higher mean values than the adolescents’ group. Children revealed that they have a better perception of HRQoL than the adolescents, nonetheless, the children ( the younger group) seem more affected by bullying , as victims (e.g. fear, made fun of and provoked). Our results are in line with the results reported by other authors (Bisegger, et al, 2005; Haugland et al. 2001; Simeoni et al, 2000; Topolski et al. 2001).

In relation to the SES dimension, significant differences between variables were found in terms of health-related quality of life, except for the “Autonomy” dimension. Individuals with medium/high SES have significantly higher mean values than individuals with low SES, except regarding “Autonomy”, where participants with low SES present a slightly (non-significant) more positive perception. The family SES has impact and is a strong predictor of quality of life in children and adolescents. It emerges as being associated with the health, quality of life, cognitive, social and emotional development of the child and adolescent (Bradley & Corwyn, 2002). Nonetheless, the relation between the subjective perception of quality of life and SES is not consistent. Some studies show SES differences in psychological well-being (Gaspar et al, 2006; Starfield et al, 2002), while other authors suggest that in terms of global evaluation of an individual’s psychological well-being, childhood and adolescence are characterized by small or inexistent differences (West, 1997). Children from families with low SES experience lower levels of emotional well-being and present more behavioral problems than children coming from families with high SES (Rueden, et al 2006).

Some of our specific results are yet worth mentioning. Namely, we’ve shown that the impact of the psychological variables on health-related quality of life is higher in the children’s sample (aged 10 to 11) and smaller in male students. Also, physical health has a greater impact on the HRQoL of boys and social variables have a stronger impact on girls. These results highlight differences in HRQoL and are explained by the intimate relationship between psychological well-being and family relations (Palmer & Hollin, 2001). To be more specific, and according to the literature, girls and children show a more satisfactory relationship with their family members and are involved in more activities with them than boys and adolescents (Matos, et al, 2006a). Moreover, girls have a tendency to internalize problems and difficulties, while boys tend to externalize these conflicts (Currie et al, 2004; Matos et al, 2006a). In this sense, girls have less difficulty in speaking about their intimacy either with girls or with boys, while boys either don’t speak about intimacy issues at all, or they are very selective regarding who

they choose to talk to. (Colarossi & Eccoles, 2003; Coventry, et al, 2004; Matos et al, 2006a). Boys have higher HRQoL in physical health probably due to their physical activities with peers such as collective games and other leisure activities.

These results reflect different patterns in terms of HRQoL in children and adolescents, which should be considered when promoting health and well-being; they also indicate possible challenges and adequate specific practices for each intervention group.

The present findings concur with the literature on gender differences, and on gender differences related beliefs, indicating that both children and the family environment are prone to perceive and support gender differences. Our results also coincide with those reported by previous research in areas such as health-related quality of life and developmental psychology, and also confirm results from the general literature on personal and social differences (Harding, 2001; Caldera & Hart, 2004; Matos et al, 2006a).

An analysis of the models we've developed also indicates that girls, children and students with high SES report higher levels of health-related behaviors than boys, adolescents and students with low SES. More specifically, girls, children and students with higher SES are healthier particularly when considering drugs, diet violent behavior (Currie et al, 2004; Matos et al, 2006a).

The results of this study allow a better understanding of the impact of personal and social factors in promoting HRQoL in children and adolescents. They can also help us identify risk-groups (e.g. risk factors related with gender, age and SES). In this particular study, results show that girls, adolescents and participants with low SES have a less positive perception of their HRQoL, a situation which is a risk factor in itself for their health and well-being. The assessment of HRQoL in children provides us with the necessary information to develop ways of promoting quality of life in these age groups. Another important element that emerged in this study was the possibility of identifying the risk factors for children and adolescents' well-being and of preventing the negative effects caused by these factors.

Health promotion involves an active support of the physical, psychological and social well-being of children and adolescents. In promoting health, we should thus consider factors that put children's and adolescents' well-being at risk, through preventive interventions based on mediating health at all levels. Subjective health and perceived well-being are considered important aspects in promoting health and are also relevant indicators in areas such as public health.

In terms of public health and health psychology, HRQoL monitoring is imperative in children and adolescents with and without chronic illness and exhibiting various individual, social and cultural differences. In this respect, we suggest that a longitudinal study or future replications of our study could prove useful. It is therefore pertinent to use instruments such as the KIDSCREEN and other measures of variables that promote HRQoL in clinical and in academic

settings, in individual and in community evaluation programs of HRQoL intervention and promotion in children and adolescents. Finally, we believe that the topic of HRQoL is definitely worth further studies in psychology, health sciences, psychosocial and educational research.

#### REFERENCES

- Bentler, P. (1999). Comparative Fit Indexes in Structural Models. *Psychological Bulletin*, 107, 238-246
- Bisegger, C., Cloetta, B., von Rueden, U., Abel, T., Ravens-Sieberer, U., and the European KIDSCREEN group. (2005). Health-related quality of life: gender differences in childhood and adolescence. *Soz.-Präventivmed*, 50, 281-291.
- Bradley, R., & Corwyn, R. (2002). Socioeconomic status and children development. *Annual Review of Psychology*, 53, 371-399.
- Bramston, P., Chipuer, H. & Pretty, G. (2005). Conceptual principles of quality of life: an empirical exploration. *Journal of Intellectual Disability Research*, 49(10), 728-733.
- Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, CA: Sage.
- Browne, M., & Cudeck, R. (1993). Alternative Ways of Assessing Model Fit. In K. Bollen & J. Long (Eds) *Testing Structural Equation Models* (pp 136-162). Thousand Oaks, CA: Sage.
- Byrne, B. M. (1998). *Structural equation modelling with LISREL, PRELIS, and SIMPLIS: Basic concepts, applications, and programming*. Mahwah, NJ: Lawrence Erlbaum.
- Caldera, Y., & Hart, S. (2004). Exposure to Child Care, Parenting Style and Attachment Security. *Infant and Child Development*, 13, 21-33.
- Chen, E., Matthews, K., & Boyce, W. (2002). Socioeconomic Differences in Children's Health: How and Why Do These Relationships Change With Age? *Psychological Bulletin*, 128(2), 295-329.
- Colarossi, L., & Eccles, S. (2003). Differential effects of support on adolescents' mental health. *Social Work Research*, 27(1), 19-30.
- Coventry, W., Gillespie, N., Heath, A., & Martin, N. (2004). Perceived social support in a large community sample: age and sex differences. *Soc Psychiatry Epidemiol*, 39, 625-636.
- Cummins, R. (2005). Moving from the quality of life concept to a theory. *Journal of Intellectual Disability Research*, 49(10), 699-706.
- Currie, C., Samdal, O., Boyce, W., & Smith, R. (2001). *HBSC, a WHO cross national study: research protocol for the 2001/2002 survey*. Copenhagen: WHO.
- Eiser, C., & Morse, R. (2001). A review of measure of quality of life in children with chronic illness. *Arch Disability Child*, 84, 205-211.
- Fleming, M.C., & Nellis, J.G. (2000). *Principles of applied statistics*. London: Thomson.
- Gaspar, T. (2009) *Quality of life in children and adolescents*, (PhD thesis, non published). FPCE, Oporto University
- Gaspar, T., & Matos, M. (Eds) (2008). *Versão portuguesa dos instrumentos KIDSCREEN-52: Instrumentos de Qualidade de Vida para Crianças e Adolescentes*. (Portuguese

- Version of KIDSCREEN Instruments of Quality of Life in Children and Adolescents) (Lisbon, FMH)
- Gaspar, T., Matos, M., Ribeiro, J., & Leal, I. (2006). Qualidade de vida e bem-estar em crianças e adolescentes (Quality of life and well-being in children and adolescents). *Revista Brasileira de Terapias Cognitivas* 2(2) 47-60
- Gaspar, T., Matos, M.G., Ribeiro, J., & Leal, I. (2005). Saúde, qualidade de vida e desenvolvimento (Health, quality of life and development). In M. Matos (Eds.) *Comunicação, Gestão de Conflitos e Saúde na Escola*. (Communication, conflict management and health in school) (pp. 61-68) (Lisboa, Faculdade de Motricidade Humana)
- Harding, L. (2001). Children's Quality of Life Assessments: a review of genetic and health-related quality of life measures completed by children and adolescents. *Clinical Psychology and Psychotherapy*, 8, 79-96.
- Harter, S. (1985). *Manual for the Self-Perception Profile for Children*. Denver: University of Denver Press.
- Haugland, S., Wold, B., Stevenson, J., Aaroe, L., & Woynarowska, B. (2001). Subjective health complaints adolescence: a cross-national comparison of prevalence and dimensionality. *European Journal Public Health* 11, 4-10
- Koot, H. (2002). Challenges in child and adolescent quality of life research. *Acta Paediatrica*, 91, 265-266.
- Joreskog, K., & Sorbom, D (Eds) (2001). *LISREL 8: User's Reference Guide*. (Lincolnwood: Scientific Software International)
- Martins, M., Peixoto, F., Mata, L., & Monteiro, V. (1995). Escala de auto-conceito para crianças e adolescentes de Susan Harter (Self-Perception Profile for Children). In L.S. Almeida, M. R. Simões & M. M. Gonçalves (Eds.). *Provas Psicológicas em Portugal (79-89)* (Psychological Tests in Portugal). Braga: APPORT.
- Matos, M., Simões, C. et al. (2006). *A Saúde dos Adolescentes Portugueses – Hoje e em 8 anos – Estudo HBSC 2006*. (Portuguese Adolescents' Health – HBSC Study 2006) retrieved at [www.aventurasocial.com](http://www.aventurasocial.com)
- Matos, M., Gaspar, T., et al. (2006). *Qualidade de Vida em Crianças e Adolescentes: Projecto Europeu KIDSCREEN*. (Quality of Life in Children and Adolescents – European KIDSCREEN Project) retrieved at [www.aventurasocial.com](http://www.aventurasocial.com)
- McCullough, G., Huebner E., & Laughlin, J. (2000). Life Events, Self-Concept, and Adolescents' Positive Subjective Well-Being. *Psychology in the Schools*, 37(3), 281-290 .
- Palmer, E., & Hollin, C. (2001). Sociomoral Reasoning, Perceptions of Parenting and Self-Reported Delinquency in Adolescents. *Applied Cognitive Psychology*, 15, 85-100.
- Patrão, I., Maroco, J., & Leal, I. (2006). Validação da Escala de Satisfação com o Suporte Social (ESSS) (Validation of SSSS). *Actas do 6º Congresso Nacional de Psicologia da Saúde*. Faro: Universidade do Algarve.
- Ravens-Sieberer et al. (2001). Quality of life in children and adolescents: a European public health perspective. *Preventivmed*, 46, 294-302.
- Ravens-Sieberer et al. (2005). KIDSCREEN-52 quality-of-life measure for children and adolescents. *Expert Review of Pharmacoeconomics & Outcomes Research*, 5(3), 353-364.
- Ribeiro, J. (1999). Escala de Satisfação com o Suporte Social (ESSS). (Satisfaction with social support scale - SSSS) *Análise Psicológica*, 3(17), 547-558.

### Articles Section

---

- Rueden, U. et al. (2006). Socioeconomic determinants of health-related quality of life in childhood and adolescence: results from a European study. *J Epidemiol Community Health, 60*, 130-135.
- Scheier, M., Carver, C., & Bridges, M. (1994). Distinguishing Optimism from Neuroticism (and Trait Anxiety, Self-Mastery, and Self-Esteem): A Reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67*(6), 1063-1078.
- Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modelling*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Simeoni, M., Auquier, P., Antoniotti, S., Sapin, C., & San Marco, J. (2000). Validation of a French health-related quality of life instrument for adolescents: the VSP-A. *Quality of Life Research 9*, 393-403
- Starfield, B., Riley, A., Witt, W., et al (2002). Social class gradients in health during adolescence. *Journal of Epidemiological Community Health, 56*, 354-361.
- STEP/BIT (2003). *A Luta Contra a Pobreza e a Exclusão Social* (Fighting against poverty and social exclusion) (Geneve: Bureau Internacional do Trabalho)
- The KIDSCREEN Group Europe. (2006). *The KIDSCREEN questionnaires: quality of life questionnaires for children and adolescents*. (Germany, Pabst Science Publishers)
- Topolski, T., Patrick, D., Edwards, T., Huebner, C., Connell, F., & Mount, K. (2001). Quality of life and health-risk behaviors among adolescents. *Journal Adolescent Health 29*, 426-35
- Wallander, J. L., & Schmitt, M. (2001). Quality of life measurement in children and adolescents: issues, instruments and applications. *Journal of clinical psychology 57*(4), 571-585.
- West, P. (1997). Health inequalities in the early years: is there equalisation in youth? *Social Scientific Medicine, 44*, 833-858.
- WHOQOL Group (1994). Development of the WHOQOL: Rationale and current status. *International Journal of Mental Health, 23*, 24-56
- WHOQOL Group (1995). The World Health Organization quality of life assessment (WHOQOL): Position paper from the World Health Organization. *Social Science Medicine, 41*, 1403-1409.
- World Health Organization Quality Of Life Assessment Group (1996). What is Quality of Life? World Health Organization Quality Of Life Assessment (WHOQOL): World Health Forum.
- WHOQOL Group (1998a). The World Health Organization quality of life assessment (WHOQOL): Development and general psychometric properties and results of international field trial. *Social Science Medicine, 46*, 1569-1585.
- WHOQOL Group (1998b). Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychology and Medicine, 28*, 551-558.