

# Emotional Problems and Substance Use in Adolescents: Gender and Age Differences and Psychosocial Determinants

## Emotional Problems and Substance Use

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**Abstract- Purpose of the research:** the present study aimed at identifying gender and developmental aspects, and their psychosocial determinants and the time trends over 8 years in the prevalence of emotional problems among children and adolescents in Portugal. The three cross-sectional self-report surveys obtained from the HBSC nationally representative samples of 10-17 year old children and adolescents in 1998, 2002, and 2006, were used. Specific composite indexes included emotional and somatic symptoms, substance use, demographic and psychosocial factors.

**Results and conclusions:** Girls reported more emotional symptoms and boys reported more substance use. Emotional symptoms, substance use and communication increased with age, opposite to school commitment and perception of safe neighbourhood, which have shown to decrease with age. Along the three waves, substance use and emotional symptoms have shown a general pattern of decrease.

**Innovation:** Results were discussed according to literature and their consequences for the understanding of emotional problems and substances in childhood and adolescence, namely gender differences and the implications regarding school based interventions.

**Keywords-** *Emotional Problems; Gender; Development; Trends; Psychosocial Determinants; HBSC; Adolescents*

## I. INTRODUCTION

Internalizing and externalizing problems in childhood and adolescence are very common and particularly relevant, due to their impact on psychosocial development. Among emotional and behavioural problems in childhood and adolescence, anxiety, depression, and substance use disorders are referred in literature as the most common [1-3]. Lifetime prevalence rates for depression range from 15 to 20% in clinical samples [4] and from 22 to 60% in community samples [5], whereas lifetime prevalence rates for anxiety range from 11 to 17% in community samples and from 27 to 45% in clinical samples [6]. Amongst behavioural problems, substance use, which is most reported in adolescence, may be a consequence of the maintenance of emotional and behavioural problems [7].

Gender and developmental differences in emotional and behavioural problems are also well documented: girls report more emotional problems and boys report more behavioural problems [8-10]; behavioural problems decrease and emotional problems increase with age [11-13].

According to the main theoretical models on emotional and behavioural disorders in childhood and adolescence, different factors are involved on their onset, maintenance, and modification. Several studies carried out in order to identify these factors have shown that genetic [14], individual - attachment, temperament, emotional dysregulation, and information processing [15], family - parental psychopathology and communication [16-18], and social/contextual variables - peers pressure, school, neighbourhood, and life events [19, 20], are related to emotional and behavioral problems. However, only a small number of studies specifically considered family, social and contextual factors and developmental aspects.

The goals of the present study were threefold: a) to analyse gender and grade differences for individual, family and school variables in the three waves of the nationally representative samples of the HBSC between 1998 and 2006, b) to analyse the time trends of emotional problems, substance use and related family and school factors, and c) to understand the individual, familial, and school predictors of emotional problems and substance use.

## II. METHOD

### A. Participants

The three waves of the Portuguese samples of the HBSC include 17911 adolescents, 47% male and 53% female, aged between 10 and 17 years (mean age of 14 years), in the 6<sup>th</sup> (35.3%), 8<sup>th</sup> (36.3%), and 10<sup>th</sup> school year (28.3%), randomly assigned from national schools and stratified, representing the whole country.

In 1998, the first Portuguese sample was composed of 6903 children and adolescents, 53% females and 47% males, with a mean age of 14 years [21]. In 2002, the second sample was composed of 6131 children and adolescents, 49% males and 51% females, also with a mean age of 14 years [22]. Finally, in 2006, 4877 children and adolescents composed the third sample, 50.4% females and 49.6% males [23].

Table 1 shows the demographic characteristics of the three samples, according to the database year.

TABLE 1 SHOWS THE DEMOGRAPHIC CHARACTERISTICS OF THE THREE SAMPLES, ACCORDING TO THE DATABASE YEAR

	1998		2002		2006	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Gender						
Male	3241	47	2417	49.6	3006	49
Female	3662	53	2460	50.5	3125	50
School Year						
6 <sup>th</sup> grade	2409	31.7	1546	31.7	2369	38.6
8 <sup>th</sup> grade	2589	37.5	1740	35.7	2181	35.6
10 <sup>th</sup> grade	1905	27.6	1591	32.6	1581	25.8
	1998		2002		2006	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	14.12	1.71	14	1.85	14.05	1.89

### B. Measures

The questionnaire [24] was composed of two parts. The main part included a demographic data section and the assessment of school environment, alcohol and tobacco consumption, violence, physical activity and hobbies, nutrition, security, psychosocial health, general symptoms, social relationships and social support. In the second part, questions about drug consumption and HIV information, attitudes and behaviours were included. Each questionnaire required about 55 minutes to be administered. In the present study, several composite indexes were computed, in order to assess the main individual (emotional problems and substance use), family, peer (communication), and contextual factors (commitment to school and safe neighbourhood): school commitment was assessed by the sum of the five items related to school factors; emotional problems were assessed by the sum of the participants' responses to the 10 items assessing somatic symptoms and nervousness and sadness; substance use was computed from the sum of the four items assessing smoking, alcohol and drug consumption; communication with significant others, family and friends, was assessed by the sum of the responses to the 11 relevant items, and, finally, safe neighbourhood was computed from the nine items relevant to the perception of a safe neighbourhood (see Table 2).

### C. Procedure

The schools that took part in the sampling process were randomly selected from the national schools list, and stratified by educational regions. In each school, a random selection of classes was carried out and the questionnaire was administered by the teachers in the classroom, in group, after the students' informed consent to their volunteer and anonymous participation in the study.

### D. Statistical Analysis

SPSS 18.0 for Windows (SPSS, Chicago IL, USA) was used in order to carry out Qui-square, t-Student and One-way ANOVAs tests to compare groups; multiple linear regressions were carried out to study the associations between the variables.

TABLE 2 ITEMS USED AND RANGE

Items	Range
School commitment	
School performance	1 – 4 (very good/below mean)*
Liking school	1 – 4 (a lot/not at all)*
School mates like being together	1 – 5 (always true/always false)*
School mates acceptance	1 – 5 (always true/always false)*
Homework pressure	1 – 4 (none/a lot)*
Somatic symptoms	
Headaches	1 – 5 (almost every day/almost never or never)*
Stomach aches	1 – 5 (almost every day/almost never or never)*
Nervousness and sadness	
Sad/depressed	1 – 5 (almost every day/almost never or never)*
Angry/bad mood	1 – 5 (almost every day/almost never or never)*
Nervous	1 – 5 (almost every day/almost never or never)*
Substance use	
Smoking	1 – 4 (every day/don't smoke)*
Drinking	1 – 5 (every day/never)*
Drunk	1 – 5 (never/more than 10 times)
Drugs	1 – 4 (none/regularly)
Communication with family	
At ease speaking with father	1 – 4 (very easy/very difficult)*
At ease speaking with mother	1 – 4 (very easy/very difficult)*
At ease speaking with older brother	1 – 4 (very easy/very difficult)*
At ease speaking with older sister	1 – 4 (very easy/very difficult)*
Communication with friends	
At ease speaking with best friend	1 – 4 (very easy/very difficult)*
At ease speaking with same sex friend	1 – 4 (very easy/very difficult)*
At ease speaking with other sex friend	1 – 4 (very easy/very difficult)*
Safe neighborhood	
Get along well	0 – 1 (no/yes)
Safe place	0 – 1 (no/yes)
Trust persons	0 – 1 (no/yes)
Hobbies	0 – 1 (no/yes)
Night fun	0 – 1 (no/yes)*
Violence/robbery	0 – 1 (no/yes)*
Nice	0 – 1 (no/yes)
Too withdrawn	0 – 1 (no/yes)*
Good public services	0 – 1 (no/yes)

\*reverted items.

### III. RESULTS

#### A. Descriptive Data for Individual, Family, and School Composite Indexes

Table 3 shows the descriptive data obtained for all the indexes composed to assess emotional problems, substance use, communication, and safe neighbourhood. Except for somatic symptoms and substance use, all skewness values were similar to the normal curve; kurtosis values on those variables, as for communication with significant others, also did not assume normality. However, due to the sample size, parametric statistics were used in further analyses.

TABLE 3 DESCRIPTIVE DATA FOR INDIVIDUAL, FAMILY, AND SCHOOL COMPOSITE INDEXES

	Number of items	M	SD	Range	Skewness	Kurtosis
School commitment	5	16.72	2.35	5-22	-.51	.62
Emotional Symptoms	5	9.34	.408	5-25	1.05	.60
Somatic symptoms	2	3.24	1.74	2-10	1.51	1.82
Nervousness and sadness	3	6.11	3.05	3-15	.96	.11
Substance use	4	5.44	2.31	4-18	2.32	5.83
Communication with significant others	7	24.06	3.91	7-35	-.66	1.21
Family	4	14.33	2.82	4-20	-.93	1.07
Friends	3	9.69	2.08	3-15	-.56	.69
Safe neighbourhood	9	12.21	1.87	7-18	-.33	1.03

### B. Time Trends of Substance Use

The evolution of substance use was analysed along the three waves (see Table 4). Significant associations between the database year and smoking consumption,  $\chi^2(6) = 127.36$ ,  $p = .0001$ , alcohol consumption,  $\chi^2(8) = 971.97$ ,  $p = .0001$ , drunkenness,  $\chi^2(8) = 44.69$ ,  $p = .0001$ , and drug consumption,  $\chi^2(6) = 158.17$ ,  $p = .0001$ , were found. Although most of the participants did not report consumptions, an increase of smoking consumption, regular drinking and drug consumption was found in 2002. The increase in regular drug consumption was maintained in 2006. A different pattern was verified for the number of drunkenness episodes; although, again, most of the participants reported not having drunkenness episodes, in 1998 more adolescents reported having been drunk more than once whereas in 2006 more adolescents reported being drunk two or three times.

TABLE 4 SUBSTANCE USE ACCORDING TO THE DATABASE YEAR

	1998 (N = 6561)		2002 (N = 5921)		2006 (N = 4713)		$\chi^2$
	N	%	N	%	N	%	
Smoking consumption							127,36***
I don't smoke	<b>5915</b>	<b>86.9</b>	4943	81.4	<b>4212</b>	<b>87.8</b>	
Less than once a week	339	5	<b>340</b>	<b>5.6</b>	211	4.4	
At least once a week	185	2.7	<b>274</b>	<b>4.5</b>	132	2.8	
Everyday	368	5.4	<b>513</b>	<b>8.5</b>	240	5	
Alcohol consumption							971,97***
Never	2788	42.6	<b>3829</b>	<b>63.7</b>	<b>2999</b>	<b>62.6</b>	
Rarely	<b>3109</b>	<b>47.5</b>	1447	24.1	1257	26.2	
Every month	433	6.6	394	6.6	323	6.7	
Every week	195	3	<b>283</b>	<b>4.7</b>	179	3.7	
Everyday	26	.4	<b>60</b>	<b>1</b>	33	.7	
Drunk							44,69***
Never	<b>5356</b>	<b>77.9</b>	4562	75.5	3552	73.7	
Once	763	11.1	715	11.8	553	11.5	
Two or three times	471	6.8	445	7.4	<b>425</b>	<b>8.8</b>	
Four to ten times	140	2	173	2.9	155	3.2	
More than ten times	<b>148</b>	<b>2.2</b>	150	2.5	134	2.8	
Drugs consumption (one month)							158.17***
Never	<b>6155</b>	<b>97.5</b>	5227	93.4	4237	95.5	
Once	66	1	<b>132</b>	<b>2.4</b>	86	1.9	
More than once	90	1	<b>152</b>	<b>2.7</b>	66	1.5	
Regularly	0	0	<b>86</b>	<b>1.5</b>	<b>48</b>	<b>1.1</b>	

Note: \*\*\*  $p < .001$ . Adjusted residuals superior to 1.9 are shown in bold.

### C. Time Trends in Individual, Family, Peers and Contextual Factors

Individual, family, peer and contextual factors' evolution was studied according to gender (except for school commitment which showed no gender differences). Univariate ANOVA performed for school commitment showed a significant difference,  $F(2; 17192) = 276.01$ ,  $p = .000$ , with 6th graders reporting less school commitment than 8th graders, who reported less school commitment than 10th graders (see Table 5).

TABLE 5 DATABASE YEAR COMPARISONS FOR SCHOOL FACTORS

	1998 (a) (N = 6561)		2002 (b) (N = 5921)		2006 (c) (N = 4713)		F
	M	SD	M	SD	M	SD	
School commitment	17,24	2,21	16,47	2,42	16,29	2,34	276,01*** a>b>c

Note: \*\*\*  $p < .001$

### D. Psychosocial Predictors of Emotional Problems and Substance Use

Linear multiple regression analysis, using the stepwise method ( $p < .05$ ), was performed, in order to identify the main factors predicting emotional symptoms and substance use (see Table 6).

TABLE 6 PSYCHOSOCIAL PREDICTORS OF EMOTIONAL AND PROBLEMS AND SUBSTANCE USE

IV	Step	DV	$R^2$	$R^2_{adjusted}$	$\beta$	$t$
Emotional symptoms	1	School commitment	.101	.100	-.28	-16.04***
	2	Gender	.133	.132	.16	9.42***
	3	Communication with family	.143	.142	-.10	-5.75***
	4	Safe neighborhood	.144	.143	.03	2.26*
	5	School grade	.146	.144	.03	2.11*
Explained variance			14.4%			
IV	Step	DV	$R^2$	$R^2_{adjusted}$	$\beta$	$T$
Substance Use	1	School grade	.107	.106	.27	15.17***
	2	School commitment	.143	.142	-.19	-10.85***
	3	Communication with friends	.160	.159	.16	6.87***
	4	Gender	.166	.165	-.08	-4.62***
	5	Communication with significant others	.168	.166	-.05	-2.06*
Explained variance			16.6%			

Note: IV = Independent variable; DV = Dependent variable; \*  $p < .05$ ; \*\*\*  $p < .001$ .

For emotional symptoms, a model composed of five independent variables was identified, and it explained about 14% of total variance; less school commitment,  $\beta = -.28$ ,  $t = -16.04$ ,  $p = .0001$ , female gender,  $\beta = .16$ ,  $t = 9.42$ ,  $p = .0001$ , less communication with family,  $\beta = -.10$ ,  $t = -5.75$ ,  $p = .0001$ , higher perception of a safe neighbourhood,  $\beta = .03$ ,  $t = 2.26$ ,  $p = .024$ , and lower school grade,  $\beta = -.28$ ,  $t = -16.04$ ,  $p = .0001$ , were associated with more emotional symptoms. For substance use, a model composed of five independent variables was also identified, explaining about 17% of the total variance; higher school grade,  $\beta = .27$ ,  $t = 15.17$ ,  $p = .0001$ , less school commitment,  $\beta = -.19$ ,  $t = -10.85$ ,  $p = .0001$ , more communication with friends,  $\beta = .16$ ,  $t = 6.87$ ,  $p = .0001$ , male gender,  $\beta = -.08$ ,  $t = -4.62$ ,  $p = .0001$ , and less communication with significant others,  $\beta = -.05$ ,  $t = -2.06$ ,  $p = .039$ , were associated with more substance use.

#### IV. DISCUSSION

The present study focused on gender and grade differences in individual, family and school variables in the three waves of the nationally representative sample of the HBSC between 1998 and 2006 and intended to analyse the time trends of emotional problems, substance use and related family and school factors as predictors of emotional problems and substance use.

Gender differences were according to the literature, with girls reporting more emotional symptoms and boys reporting more substance use [8-11]. Gender comparisons for communication with significant others and perception of a safe neighbourhood were also according to literature [17, 18, 20]. Also, developmental differences on emotional and behavioural symptoms, communication with significant others, and school commitment were supported by literature [9, 10, 20]. The increase of smoking consumption, regular drinking and drug consumption in 2002, followed by a subsequent decrease, except for regular drug consumption, evidences a pattern similar to the pattern obtained in other countries [2, 3]. Finally, the analysis of the psychosocial predictors of emotional problems and substance use showed a set of common factors, school commitment, school grade and gender, and a set of specific factors, communication with family and perception of a safe neighbourhood (emotional symptoms) and communication with friends and, in general, with significant others (substance use). These results are according to the literature [9, 12, 17, 18, 20], which show the importance of the interactions between individual and social factors to emotional and behavioral problems. Although its limitations, namely related to the nature of the sample, non-clinical, and the fact that only addressed a set of all the main variables that are, according to the literature, relevant for explaining emotional and behavioural problems, and the fact that future studies should empirically test the interactions between individual, social and contextual factors involved in the onset and maintenance of emotional and behavioural problems, these findings may present important implications for the development of prevention and intervention programs, according to grade and gender in order to address specific needs and lighten up their efficacy.

Mental health problems have a major impact on adolescents' well-being. Girls and boys seem to experience this impact in different ways, and older adolescents seem to be affected to a greater extent. Despite this major influence, mental health is a poorer area of intervention in school-based health promotion interventions. In recent years (2005 to 2007), a major change took place in Portuguese Schools, reinforcing the importance of health education, and mental health was included as a major focus, together with sexual and reproductive health, substance use, nutrition, active leisure and interpersonal violence [25]. Recent studies evidenced

that increasing social and personal competences (such as self-regulation, negotiating, interpersonal communication and problem solving), and providing social support from significant others can be the golden standard for the promotion of wellbeing and mental health along childhood and adolescence [26, 27]. Recent policy guidelines [28] raised the question of children and adolescents participation in the design and implementation of interventions targeting themselves.

The Portuguese experience regarding health education in schools was very recently reviewed and, once again, was highlighted the fact that continuity is the real key word regarding interventions in schools [29]. The results are not immediate and the ultimate aim of any school-based intervention must be to permanently change school culture, allowing a better school ethos and increased health and well-being, this recent work also highlighted the importance of health promotion being seriously addressed at a government level, especially in times of economic crisis.

#### REFERENCES

- [1] K. R. Merikangas, E. F. Nakamura and D. C. Kessler, "Epidemiology of mental disorders in children and adolescents," *Dialogues in Clinical Neuroscience*, vol. 11, pp. 7-20, 2009.
- [2] E. Kuntsche, B. Simons-Morton, A. Fotiou, T. ter Bogt, A. Kokkevi, M. G. Matos and The HBSC Study, "Decrease in adolescent cannabis use from 2002 to 2006 and links to evenings out with friends in 31 European and North American countries and regions," *Archives of Pediatrics & Adolescent Medicine*, vol. 163(2), pp. 119-125, 2009.
- [3] M. G. Matos, C. Simões, J. Batista-Foguet and J. Cottiaux, "Facteurs personnels et facteurs sociaux associés à la perception de santé et à la perception de bonheur, dans une population adolescente non clinique," (Personal and Social factors associated to the epreption of health and well being within a non clinical adolescent population), *L'Encephale*, vol. 36(1), pp. 39-45, 2010.
- [4] R. C. Kessler and E. E. Walters, "Epidemiology of DSM-III-R major depression and minor depression among adolescents and young adults in the National Comorbidity Survey," *Depression and Anxiety*, vol. 7, pp. 3-14, 1998.
- [5] M. Y. Kubik, L. A. Lytle, A. S. Birnbaum, D. M. Murray and C. L. Perry, "Prevalence and correlates of depressive symptoms in young adolescents," *American Journal of Health Behaviour*, vol. 27, pp. 546-553, 2003.
- [6] C. A. Essau, J. Conradt and F. Peterman, "Frequency, comorbidity, and psychosocial impairment of anxiety disorders in German adolescents," *Journal of Anxiety Disorders*, vol. 14, pp. 263-279, 2000.
- [7] R. C. Kessler, P. A. Berglund, G. Borges, R. C. Castilla-Puentes, M. D. Glantz, S. A. Jaeger, K. R. Merikangas, M. K. Nock, L. G. Russo and P. E. Stang, "Smoking and suicidal behaviors in the National Comorbidity Survey-Replication," *Journal of Nervous and Mental Diseases*, vol. 195, pp. 369-377, 2007.
- [8] N. R. Crick and C. Zahn-Waxler, "The development of psychopathology in females and males: Current progress and future challenges," *Development and Psychopathology*, vol. 15, pp. 719-742, 2003.
- [9] M. G. Matos, G. Tomé, A. I. Borges, D. Manso, C. Simões and A. Ferreira, "Anxiety, depression and coping: CDI, MASC and CRI-Y for screening purposes in schools," *Spanish Journal of Psychology*, vol. 15(1), pp. 348-356, 2012.
- [10] M. G. Matos, T. Gaspar, J. Cruz and A. M. Neves, "New Highlights About Worries, Coping, and Well-being During Childhood and Adolescence," *Psychology Research*, vol. 3(5), pp. 252-260, 2013.
- [11] M. Gilliom and D. S. Shaw, "Co-development of externalizing and internalizing problems in early childhood," *Development and Psychopathology*, vol. 16, pp. 313-334, 2004.
- [12] T. Gaspar, M. G. Matos, J. L. Ribeiro, I. Leal, M. Erhart and U. Ravens-Sieberer, "Health-related quality of life in children and adolescents: subjective well being," *Spanish Journal of Psychology*, vol. 15(1), pp. 177-186, 2012.
- [13] J. Mesman, I. Bongers and H. M. Koot, "Preschool developmental pathways to preadolescent internalizing and externalizing problems," *Journal of Child Psychology and Psychiatry*, vol. 42, pp. 679-689, 2001.
- [14] M. A. J. Sprangers, M. Bartels, R. Veenhoven, F. Baas, N. G. Martin, M. Mosing, B. Movsas, M. E. Ropka, G. Shinozaki, D. Swaab and The GENEQOL Consortium, "Which patient will feel down, which will be happy? The need to study the genetic disposition of emotional states," *Quality of Life Research*, vol. 19, pp. 1429-1437, 2010.
- [15] T. Tobias, J. Guiney, G. Fonagy, L. C. Mayes and P. Luyten, "Interpersonal stress regulation and the development of anxiety disorders: An attachment-based developmental framework," *Frontiers in Behavioral Neuroscience*, vol. 5, pp. 1-21, 2011. doi: 10.3389/fnbeh.2011.00055 .
- [16] G. Piche, L. Bergeron, M. Cyr and C. Berthiaume, "Maternal lifetime depressive/anxiety disorders and children's internalizing symptoms: The importance of family context," *Journal of Canadian Academy of Child and Adolescent Psychiatry*, vol. 20, pp. 176-185, 2011.
- [17] G. Tomé, M. G. Matos, I. Camacho, C. Simões and J. Diniz, "Portuguese adolescents: the importance of parents and peer groups in positive health," *Spanish Journal of Psychology*, vol. 15(3), pp. 1315-1324, 2012.
- [18] G. Tomé, I. Camacho, M. G. Matos and A. Diniz, "The Influence of Communication with Family and Peer Group on Well-Being and Risky Behaviour of Portuguese," *Psicologia: Reflexão e Crítica*, vol. 24(4), pp. 747-756, 2011.
- [19] C. A. McLaughlin, J. G. Green, M. J. Gruber, N. A. Sampson, A. M. Zaslavsky and R. C. Kessler, "Childhood adversities and adult psychopathology in the National Comorbidity Survey Replication (NCS-R) III: Associations with functional impairment related to DSM-IV disorders," *Psychological Medicine*, vol. 40, pp. 847-859, 2010.

- [20] J. W. Luk, T. Farhat, R. J. Iannotti and B. G. Simons-Morton, "Parent-child communication and substance use among adolescents: Do father and mother communication play a different role for sons and daughters?" *Addictive Behaviours*, vol. 35, pp. 426-431, 2010.
- [21] M. Matos and Social Adventure Team, Portuguese adolescents' health (Four years later), *Edições FMH: Lisboa*, 2003.
- [22] M. G. Matos, C. Simões, G. Tomé, T. Gaspar, I. Camacho, J. A. Diniz and Social Adventure Team, Portuguese adolescents' health today and in eight years, *Relatório preliminar do Estudo HBSC 2006, Edições FMH: Lisboa.*, 2006.
- [23] M. Matos and Social Adventure Team, Portuguese adolescents' health, *Lisboa: FMH /PEPT-Saúde*, 2000.
- [24] C. Currie, C. Roberts, A. Morgan, R. Smith, W. Settertobulte, O. Samdal and V. Rasmussen, *HBSC, and WHO cross national study: research protocol for the 2001/2002 survey*, Copenhagen: WHO, 2004.
- [25] M. G. Matos, M. I. Baptista, C. Simões, T. Gaspar, D. Sampaio, J. A. Diniz, J. Goulão, J. Mota, H. Barros, J. Boavida and L. Sardinha, Portugal: from research to practice – promoting positive health for adolescents in schools, In *Social cohesion for mental well-being among adolescents*, WHO, Copenhagen, Denmark, 2008.
- [26] Matos, M.G., & Sampaio, D. (Coord.) (2009). *Jovens com saúde: diálogos com uma geração. (Healthy young people: a dialogue with one generation)* Lisboa: Texto Editores
- [27] M. G. Matos, D. Sampaio, I. Baptista and Social Adventure Team, Adolescent's health education and promotion in Portugal: a case study of planning for sustainable practice. In Samdal, O., & Rowling, L. (Eds.), *The Implementation of health promoting schools, exploring the theories of what, why and how* (pp. 123-126). NY: Routledge Taylor & Francis Group, 2013.
- [28] M. G. Matos, A. Morgan and Social Adventure Team, Roads to whatever? Or roads to a self-fulfilled future? health assets and well-being in children and adolescents, In *Labirintos da Adolescência - Roads to Whatever* (pp. 61-85). Lisboa: Fundação Calouste Gulbenkian, 2012.
- [29] V. Ottava, D. Alexander, M. Rigby, A. Staines, A. Hjern, M. Blair, G. Tambourlini, M. G. Matos and the Riche Project Group, *Report on the roadmaps for the future, and how to reach them*, EU internal report (from <http://childresearch.eu>), 2013.