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Cross-Sectional Psychosocial Differences between Clinical and Nonclinical Samples of Overweight Adolescents

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Objective: The purpose of this study is to explore the psychosocial characteristics of overweight adolescents involved in a clinical program and compare them to two reference groups of populations living in the same region (overweight and normal weight). ***Design:*** The intervention group included 76 overweight adolescents who followed a multidisciplinary obesity program. The reference/community groups included 399 overweight and 413 normal-weight adolescents from the 2006 Portuguese survey of *Health Behaviour School Children*, a cross-sectional and international *World Health Organization* collaborative study. All variables were measured by the 2006 Health Behaviour School-Age Children self-reported questionnaire. ***Results:*** Comparisons between groups showed that adolescents following the program reported more psychological symptoms and lower scores in life satisfaction, health perception, body image and appearance. On the other hand, they reported more frequent physical activity and fruit consumption when compared to the overweight community group. Additionally, they watched less television than normal-weight community adolescents. Adolescents seeking clinical treatment had the lowest psychological scores; in regard to the lifestyle behaviour, the results were marginally higher. ***Conclusion****:* Physical activity and appearance represented two key predictors of life satisfaction that usually indicate modified barriers to weight change and wellbeing. The differences between genders will also be discussed further.

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Key Words: life satisfaction; lifestyle behavior; clinical program; community group; overweight

INTRODUCTION

Obesity may be associated with serious psychological problems, mild problems or even to no distress at all (20). The authors suggest that the focus should not be on whether obese people suffer psychological distress, but on who will suffer and by what means. Most studies on psychological characteristics of paediatric obesity have focused primarily on an undifferentiated comparison between obese and nonobese children, making no distinction between clinical and nonclinical samples (6, 16, 37). The few studies that have included both clinical and nonclinical samples showed that adults seeking treatment have more psychological distress than obese adults in a community sample (15,19, 26, 35). Studies on childhood obesity showed similar results. Higher scores in psychological problems were show in clinical samples when compared to nonclinical samples, indicating that the status of help seekers and being subject in a clinical sample are important factors (6). Additionally, obese adolescents in a clinical setting show a higher ratio of psychopathology (depression, behavioural problems and low-esteem) than obese adolescents belonging a non-clinical sample or to normal-weight control group (13).

A recent review of the effectiveness of obesity treatments concluded that future high quality research is required in order to address the lack of evidence of lifestyle interventions to achieve long-term behaviour

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changes in young people. This review considers psychosocial determinants to identify moderators and mediators of the interventions to produce enduring changes (28, 45). Recent recommendations support intensive age appropriate lifestyles modifications (dietary, physical activity and behaviour) for the patient and family, despite the small or moderate improvements in the short term (1).

The proportion of obese and overweight adolescents who have an accurate perception of weight, intend to lose weight, and have taken recent action to lose weight suggests that this group is highly motivated and engaged in weight-related behavioural change (14). Nevertheless, the discrepancy between these proportions and the rising prevalence of overweight subjects implies that adolescents are taking actions which are not effective (14).

The psychological functioning of overweight youth is a growing concern (21,25,27,32) although it has not been studied sufficiently. Problems such as low self-esteem, depression, body dissatisfaction, disturbed eating, provocation and bullying might have more impact on health and well-being of obese children and adolescents (at least in the short term) than many of the adverse physical consequences of obesity. These might have only a long term impact in adulthood (7, 11, 17, 42, 43).

Regarding lifestyle behaviour, overweight adolescents showed a significantly lower frequency of health-related behaviours than the non-overweight group (8, 32). These behaviours included exercise and other psychosocial factors such as stress management, life appreciation, health responsibility, and social support (8). In self-rated health studies, both boys and girls reported a non-healthy status when compared to their peers with a high health status. They were less physically active, slept less, were more likely to be overweight and, scored lower on loneliness, shyness, hopelessness and happiness (32). Of 176 adolescents, aged 12-16 years, meeting the physical activity (60 minutes moderate-to-vigorous physical activity/day), fruit and vegetable intake (five portions of FV per day) and breakfast recommendations (eating breakfast five days per week), only 6% met all three recommendations, and almost 54% had multiple risk behaviours. Girls had significantly more risk factors than boys. For adolescents with two risk behaviours, the most prevalent cluster was formed by not meeting the physical activity and fruit and vegetable recommendations. Thus, many adolescents fail to meet multiple diet and physical activity recommendations, highlighting that physical activity and dietary behaviours do not occur in isolation (33). Longitudinally, adolescent screen time hours had a stronger influence on obesity in females than males. Reducing screen time during adolescence and into adulthood may be a promising strategy for reducing the incidences of obesity, especially in females (5). Studies of clinical samples typically report poorer psychological well-being in treatment seekers when compared to population-based obese and normal-weight controls (6, 13). However, research in community samples suggests that despite moderate levels of body dissatisfaction, few obese children are depressed or have low self-esteem (36, 44).

This study aims to explore the relationship between overweight adolescents and psychosocial factors (focusing on both psychological variables and lifestyle behaviours) and tries to answer the following question: Are overweight adolescents in clinical settings different from their overweight and normal-weight peers belonging to the community? Are the scores on the variables lower in all domains? Thus, one objective was to analyse the differences between three samples: overweight adolescents following a clinical program and two groups of adolescents (normal weight and overweight) from the community. Psychosocial variables were focused on life satisfaction, health perception, body image and appearance, and lifestyle behaviour, such as physical activity, screen time and fruit consumption. We also analyse life satisfaction predictors as a quality of life measurement and adolescents' wellbeing and compared the differences between genders in the three samples.

MATERIAL AND METHODS

Subjects

The intervention group included 76 overweight boys and girls ages 10 to 17 years old, clinically followed at the obesity outpatient clinic of a central hospital in Lisbon. These subjects were involved in a multidisciplinary program that comprises clinical (paediatrician), and nutritional and exercise consultation, as well as a psychologist when needed. Health behaviour change was attended by different specialists. The sessions took place every three months (the second session took place one month after the first) and took from 30 to 45 minutes. Adolescents were followed without discontinuity until they reached age 18. This represents a convenience sample, including all the adolescents who attended the consultation between November 15 and December 15, 2006, and agreed to answer the questionnaire (between the first and second month of treatment). Inclusion criteria for participants included that they were attending up to the tenth grade (regarding the community samples), not receiving psychological treatment or medication, and not answering the HBSC questionnaire during its official collection in school. The community groups were both from the 2006

Table 1. Gender differences in the three groups (T-Student).

	Intervention group					Overweight reference group					Normal-weight reference group				
	Boys		Girls			Boys		Girls			Boys		Girls		
	N	*%*	*N*	*%*		*N*	*%*	*N*	*%*		*N*	*%*	*N*	*%*	
	33	*43.4*	*43*	*56.6*		*210*	*52.6*	*189*	*47.4*		*198*	*47.9*	*215*	*52.1*	
	M	*SD*	*M*	*SD*	t	*M*	*SD*	*M*	*SD*	*t*	*M*	*SD*	*M*	*SD*	t
Psychological Factors															
Life satisfaction	6.24	1.94	6.33	2.32	-0.18	7.20	1.93	6.86	2.10	1.68[(b)]	7.36	1.81	7.39	1.89	-0.12
Health perception	2.48	0.71	2.33	0.69	0.93	3.09	0.69	2.75	0.81	4.49***	3.38	0.68	3.08	0.72	4.28***
Body image	4.19	0.40	4.40	0.50	-2.03***	3.76	0.74	4.11	0.64	-5.03***	2.91	0.68	3.13	0.74	-3.16**
Appearance	2.94	1.01	2.71	0.78	1.10	3.30	0.86	2.98	0.94	3.37***	3.56	0.81	3.41	0.86	1.81[(c)]
Psychol. symptoms	0.78	0.78	1.25	0.89	-2.41	0.71	0.83	1.02	0.94	-3.57**	0.57	0.66	0.89	0.84	-4.19***
Health Behaviours															
Days 60'PA	4.03	2.17	3.56	1.79	1.04	3.56	1.92	2.91	1.81	3.45**	4.26	2.10	2.83	1.82	7.39*
Sport/leisure	5.03	1.76	5.07	1.42	-0.11	5.14	1.40	4.13	1.78	6.29***	5.43	1.47	4.28	1.67	7.34***
Fruit consumption	3.42	1.06	3.88	1.02	-1.89[(a)]	3.00	0.68	3.13	0.58	-1.99*	3.53	0.97	3.73	0.99	-2.01***
Screen time															
TV, video	2.92	1.48	2.71	1.49	0.63	2.94	1.78	3.39	1.83	-2.50*	3.28	1.80	3.32	1.69	-0.26
PlayStation	2.26	1.86	1.01	1.28	3.44**	2.58	2.05	1.27	1.69	6.83***	2.47	1.94	1.19	1.50	7.46***
Internet	1.94	1.69	1.03	1.07	2.83**	1.93	1.95	1.61	1.97	1.60	1.57	1.86	1.64	1.68	0.39

******* $p < .001$;**$p < .01$;*$p<.05$; *M*=Mean; *SD*=Stand Deviation; [(a)]$p=.062$; [(b)]$p=.094$; [(c)]$p=.072$

Portuguese survey of *Health Behaviour School Children* (29), a cross-sectional and international World Health Organization collaborative study (10). The groups represented 16.6% of the sample (N= 4877) and the selection was based on a geographic area of the country (the capital – the same region where the clinical sample lived). The community groups consisted of 399 overweight adolescents between 11 and 16 years old and 413 normal-weight adolescents between 10 and 16 years old. Adolescents were included in normal and overweight categories according to their BMI, using age and gender defined by Cole and colleagues (9) as the cut off points. Adolescents whose BMI was above the 85th percentile were classified as overweight.

Measures

All measures were obtained from the 2006 Health Behaviour School-Age Children self-reported questionnaire (10, 29).

***Health behaviour*:** The physical activity (PA) was measured by the number of weekdays (1-7) in which 60 minutes of moderate to vigorous intensity PA (days of 60'PA) was performed. The times per week spent in sports or exercise out of school (sports in leisure) was measured by a seven-point scale (never, less than once a month, once a month, once a week, two to three times a week, four to five times a week, every day). Screen time per week (watching TV, playing computer games such as PlayStation or computer use for homework/Internet) was measured by hours per week. Weekly consumption of fruit was measured by a five-point scale (never, less than once per week, one to four days per week, five to seven days per week, more than once a day.)

Psychological variables: The perceived health was measured by a 4-point scale (poor, rather healthy, good, and excellent). Life satisfaction was measured by a ten-point scale (0= the lower life satisfaction; 10= the best life as possible). The psychological symptoms such as depression, anger, sleeping difficulty, exhaustion and fear were measured by the weighted sum of symptoms evaluated in a 0-4 point scale (rarely or never, almost every month, almost every week, more than once a week, almost every day). The perceived body image was measured by a five-point scale (very thin, thin, ideal body, fat, very fat), and the physical appearance was measured by another five-point scale (poor, not good, normal, good, very good appearance). The BMI was calculated based on a self-reported weight/height relation (kg/m^2) (18).

Table 2. Comparisons among the three groups (One way Anova).

		M	*SD*	*D.F*	*F*
Psychological Factors	Life satisfaction (N=884)			2	10.57***
	Intervention group[a]	6.29	2.15		a<b; a<c
	Overweight group[b]	7.04	2.02		
	Normal-weight group[c]	7.38	1.85		
	Health perception (N=879)			2	45.12***
	Intervention group[a]	2.40	.70		a<b<c
	Overweight group[b]	2.93	.77		
	Normal-weight group[c]	3.22	.72		
	Body image (N=844)			2	217.15***
	Intervention group[a]	4.31	.47		a>b>c
	Overweight group[b]	3.93	.72		
	Normal-weight group[c]	3.02	.85		
	Appearance (N=888)			2	25.59***
	Intervention group[a]	2.81	.89		a<b<c
	Overweight group[b]	3.15	.91		
	Normal-weight group[c]	3.48	.84		
	Psychol. symptoms (N=888)			2	5.11***
	Intervention group[a]	1.04	.87		a>c
	Overweight group[b]	0.86	.90		
	Normal-weight group[c]	0.74	.77		
Health Behaviour	Days of 60'PA (N=873)			2	3,06*
	Intervention group[a]	3.76	1.97		a>b
	Overweight group[b]	3.25	1.89		
	Normal-weight group[c]	3.51	2.08		
	Sport in leisure (N=888)			2	2,275
	Intervention group[a]	5.05	1.57		
	Overweight group[b]	4.66	1.67		
	Normal-weight group[c]	4.83	1.68		
	Fruit consumption (N=882)			2	49.96***
	Intervention group[a]	3.68	1.97		a>b; b<c
	Overweight group[b]	3.07	1.89		
	Normal-weight group[c]	3.64	2.08		
Screen time	TV, video (N=877)				
	Intervention group[a]	2.80a	2.80	2	2.78[(a)]
	Overweight group[b]	3.15a,b	3.15		a<c
	Normal-weight group[c]	3.30b	3.30		
	PlayStation (N=866)			2	1.48
	Intervention group[a]	1.56	1.67		
	Overweight group[b]	1.95	1.99		
	Normal-weight group[c]	1.80	1.84		
	Internet (N=86 3)			2	1.53
	Intervention group[a]	1.43	1.44		
	Overweight group[b]	1.78	1.96		
	Normal-weight group[c]	1.61	1.77		

****p* < .001; ***p* <.01; * *p*<.05; [(a)] *p=.062*; *M*= Mean; *SD*= Stand Deviation; D.F – degrees of freedom; a, b, c and < , > signals – represent the significant differences between groups for *p<0.05* through Tukey POSTHOC test.

Procedures: The diet was excluded, because the intervention overweight group was followed by a dietician. Other variables related to health behaviour were targeted for intervention in weight management programs with adolescents, such as physical activity, nutrition and screen time. The fruit variable was included because Portuguese adolescents are among the largest consumers of fruit, as stated by the HBSC Report (10): they are first place in the category of children up to 11 years old (52%), and sixth and fourth place, respectively, for adolescents of 13 and 15 years old. The aim was to know the impact of this variable in the study.

An informed consent was obtained from the parents of the intervention group. The study was approved by an ethics committee of the Children and Family

Table 3. Predictors of life satisfaction (N=888).

		ß	t	p	r^2
1st model	BMI	-0.149	-4.292	0.000	0.046
	Age	-0.147	-4.226	0.000	
	Gender[1]	-0.033	-0.948	0.344	
2nd model	BMI	-0.056	-1.713	0.087	0.261
	Age	-0.123	-3.805	0.000	
	Gender[1]	0.103	2.949	0.003	
Psychological Factors	Psychological symptoms	-0.305	-9.466	0.000	
	Appearance	0.282	8.699	0.000	
Health Behaviour	Fruits consumption	0.028	0.887	0.381	
	Days of 60'PA	0.105	3.287	0.001	
Screen Time	TV, video	-0.003	-0.081	0.935	
	PlayStation, Xbox	0.037	0.994	0.320	
	Internet, homework	0.046	1.339	0.181	

Dependent Variable: Life Satisfaction; [1] Boys=1; Girls=2

Department of the hospital and followed the Helsinki Declaration of Human Rights.

Statistical analysis

SPSS 15.0 for Windows (SPSS, Chicago IL, USA) was used in order to carry out T-Student to gender differences ($p<0.05$); one way Anova to compare groups (with Tukey Post Hoc Test to find the difference between each pair of groups) ($p<0.05$); and linear multiple regressions, using the Enter method to find the life satisfaction predictors ($p<0.001$ and $p<0.05$).

RESULTS

The 76 overweight adolescents engaging in the clinical program (mean age 13.6 ± 1.8) had a mean BMI of 30.8 kg/m^2 (*SD* = 5.4kg/m^2). The community groups included 399 overweight adolescents (mean age 13.8 years ±1.7; mean BMI= 27.3 ± 3.1kg/m^2) and 413 normal-weight adolescents (mean age 13.6 years ±1.7; mean BMI=19.3±2.1kg/m^2). The distribution of boys and girls by group can be seen in Table 1. No statistical differences were found for gender and age in the three groups (p >0.05).

Gender differences in the intervention group and in the two community groups

The differences between boys and girls for the study variables (Table 1) were similar in the three groups for body image (girls had worst body image) and playing computer games (more frequent in boys). There were no gender differences in the intervention group for health perception, appearance, psychological symptoms, PA and sports/leisure, but in the two community groups boys had more positive results than girls in these variables.

Comparison between the intervention and community groups

Screen time

There were no significant differences among the three groups for only three variables: sports/leisure, screen time with PlayStation and Internet.

Health behaviour

The intervention group had the highest values of days of 60'PA, but without differences regarding the normal-weight group. For fruit consumption the intervention group had the highest values, but without differences in respect to the normal-weight group.

Psychological variables

There were significant differences between the three groups (Table 2) for health perceptions, body image and appearance. The intervention group had the lowest values, followed by the overweight community group and then by the normal-weight community group. Differences were found for life satisfaction (the intervention group had the lowest values and there were no differences between the other two groups), and for psychological symptoms (the intervention group had the highest values, but without differences to the normal-weight group).

Life satisfaction predictors

In order to find the main factors predicting life satisfaction for all three groups, the regression model with the demographic variables identified BMI and age as negative predictors of life satisfaction,

Table 4. Life satisfaction predictors in the each sample.

		Intervention group (N=74)				**Overweight group** (N=399)				**Normal-weight group** (N=413)			
		ß	*t*	*p*	r^2	ß	*t*	*p*	r^2	ß	*t*	*p*	r^2
1st model	Age	-0.102	-0.81	0.416	0.013	**-0.129**	-2.40	0.017	0.022	-0.160	-3.84	0.000	0.045
	Gender[1]	-0.187	-1.51	0.135		-0.077	-1.44	0.152		-0.029	0.46	0.426	
	BMI	-0.050	-0.41	0.682		**-0.032**	-0.60	0. 550		-0.087	-0.01	0.017	
2nd model	Age	-0.026	-0.23	0.818	0.310	-0.094	-1.93	0.055	0.266	-0.157	-3.04	0.003	0.266
	Gender[1]	0.122	1.03	0.306		0.046	0.87	0.383		0.157	2.92	0.004	
	BMI	-0.222	-1.99	0.051		-0.024	-0.51	0.613		-0.019	-.38	0.705	
Psychological Factors	Psychological symptoms	-0.226	-1.86	0.067		-0.362	-7.34	0.000		-0.247	-5.18	0.000	
	Appearance	0.283	2.36	0.022		0.246	5.08	0.000		0.321	6.84	0.000	
Health Behaviours	Fruits consumption	0.212	1.93	0.059		0.147	3.09	0.002		-0.052	-1.14	0.257	
	Days of 60'PA	0.220	196	0.055		0.111	2.32	0.021		0.114	2.33	0.020	
Screen Time	TV, video	0.030	0.28	0.781		0.024	0.48	0.632		-0.041	-0.86	0.393	
	PlayStation	0.306	2.16	0.035		0.002	0.05	0.965		0.040	0.73	0.466	
	Internet	-0.187	-1.37	0.176		0.079	1.46	0.145		0.042	0.85	0.396	

Dependent Variable: Life Satisfaction; [1] Boys=1; Girls=2

4.6% of the variance. The inclusion of psychological and behaviour variables improved the model, identifying the principal predictors of life satisfaction: minor level of psychological symptoms and high level of appearance, followed by physical activity (positively associated). In this second model, age was maintained as a life satisfaction predictor (negatively associated), boys became associated to life satisfaction, but BMI was no longer associated. This model explained 26% of the variance of life satisfaction (see Table 3).

To further explore specific predictors in each of the three groups, the regression analysis was repeated separately. For the community groups (inversely) in the first model, age was a life satisfaction predictor, but only for the normal-weight group the BMI was identified as a negative predictor. In the second model, appearance was the only predictor of life satisfaction common to the three groups. The psychological symptoms (inversely) and physical activity were common predictors to the two community groups. All three groups had unique life satisfaction predictors: PlayStation screen time was a single predictor of the intervention group; fruit consumption was a single predictor of the overweight community group; and gender (boys) and age (inversely) were unique predictors of the normal-weight community group (see Table 4).

To explore which overweight subjects (interventions *vs*. community) predicted life satisfaction, this group variable was added and the analysis was repeated without the normal-weight subjects. The result showed that the community overweight group was a predictor of life satisfaction (see Table 5).

DISCUSSION

Although psychosocial functioning of overweight youth is a growing concern, minimal research has focused on social and psychological factors that appear to be associated with excessive weight (25). This study focus on psychosocial aspects and some health behaviour usually included in the behaviour weight management programs. It also compares adolescents following a weight management program with two reference population groups living in the same region with different weight status.

Regarding the intervention group, the gender differences found both community groups attenuated. Lower values of body image for girls and higher values of playing computer games for boys were the only differences manifested. In the other two community groups the girls also had the higher values for psychological symptoms, lower scores in health perception, appearance, physical activity and sports/leisure. The gender difference in the two community groups shows that the weight status does not significantly influence the typical differences between boys and girls in the general population. This concurs with the findings in the HBSC international report from the 2005/2006 survey (10) and other studies (33). Those results are consistent with the literature showing girls as a high risk group (27, 34). Studies focused on body satisfaction concluded that

Table 5. Life satisfaction predictors of overweight subjects.

		Intervention group (N=74) & **Community group** (N=399)			
		ß	***t***	***p***	r^2
1st model	Age	-0.125	-2.59	0.010	0.034
	Gender[1]	-0.072	-1.48	0.139	
	BMI	-0.117	-1.43	0.016	
2nd model	Age	-0.096	-2.20	0.029	0.295
	Gender[1]	0.055	1.17	0.243	
	BMI	-0.061	-1.36	0.174	
Psychological Factors	Psychological symptoms	-0.226	-7.60	0.000	
	Appearance	0.283	5.63	0.000	
Health Behaviour	Fruits consumption	0.168	3.76	0.000	
	Days of 60'PA	0.125	2.91	0.004	
Screen Time	TV, video	0.024	0.54	0.593	
	PlayStation	0.032	0.64	0.525	
	Internet	0.049	1.01	0.315	
Overweight subjects	(Interventions[2] *vs.*Community)	0.129	2.74	0.006	

Dependent Variable: Life Satisfaction
[1] Boys=1& Girls=2
[2]Intervention overweight group =1 *vs.* Community overweight group=2

different types of prevention programs may be needed for males and females at different development stages in order to address changes in body image and BMI (12). We hypothesise that this is also needed for weight control in overweight adolescents.

The comparative study between the intervention group and the two community groups showed that program participants did not have lower scores in all variables. In addition to their higher weight and BMI, they showed lower health perception, life satisfaction, body image and appearance; they showed higher psychological symptoms than the two community groups. However, they reported more fruit consumption and more physical activity than the overweight community group, and less TV viewing than the normal-weight community group. The weight management program possibly probably had an immediate impact on the teenagers' behaviour, at least in the short term. A strategy with impact on self-monitoring physical activity and exercise was taught in the exercise consultation. Although we cannot know the short and long term maintenance, it seems that these young adolescents made an effort to change their behaviour. In fact, a study (N=2728) showed that obese (75%) and overweight (65%) adolescents intended to lose weight and 83% and 79%, respectively, reported recent action to lose weight (14). The lower values in psychological variables were expected, not only given the literature cited, but also because the treatment did not focus specifically on that psychological aspect. In addition, some effects mentioned by the paediatrician in consultation as a consequence of not losing weight, including comorbidities, could foster health risk perception of the participants.

The regression analyses indicate that life satisfaction in all samples was primarily associated to lower psychological symptoms and higher appearance, and then by a more positive physical activity level. These data are consistent with the literature as physical activity has been associated with "feel-good" factors (2, 41) and to body dissatisfaction and psychological symptoms as the two most individual and psychologically distressing components of obesity (7, 22-24, 31). On the other hand, when the psychosocial variables were introduced, the BMI was no longer a significant predictor of life satisfaction. This result may reinforce the importance of the psychosocial factors in the psychological wellbeing of overweight adolescents, independent of their weight status. Other studies showed that BMI or the real weight was neither significant to explain body satisfaction nor dieting in adolescents when the body image is present (39, 40, 43). A meta-analysis of 117 weight loss treatments (with adults) suggests that these treatments (independent of weight loss) can reduce depression, but both treatment and weight loss can improve self-esteem (4). This finding highlights the responsibility of professionals who work with obese populations. They need to examine how weight and size issues contribute directly to the clients' presenting psychological distress. Some obese individuals who seek weight loss treatment may be better candidates for either an non-dieting related treatment or

traditional psychotherapy (3). Interventions with adolescents should strive to enhance body satisfaction and avoid messages likely to lead to decreases in body satisfaction (31). Finally, age and gender, as life satisfaction predictors, confirm the literature and alert us to the need to look at younger adolescents and normal-weight girls as two risk groups (31).

Appearance was the common predictor of life satisfaction in the three groups and the most relevant conclusion in the analysis of life satisfaction predictors separately for the three groups. This reinforces again the importance of body satisfaction or body image to psychological wellbeing, regardless of the weight (31, 43). At the same time, the lack of life satisfaction predictors in the intervention group may be explained by other psychosocial variables, such as parental attitudes or social norms. The PlayStation is a predictor for that group probably because it introduces positive emotions important for life satisfaction.

Finally, being overweight may be associated to life satisfaction, although being overweight and being in treatment simultaneously was no longer associated.

One limitation of this study is its reliance on a multi-disciplinary work conditioned by international standards. This denies autonomy to the selection of variables to consider, including the measures and scales used in the questionnaire which are unique and cannot be changed.

CONCLUSIONS

The study findings can be interpreted as an important contribution for improving weight management programs for adolescents and the interdisciplinary work necessary to address their physical and psychosocial needs. Such programs could primarily address the psychological aspects and health behaviour that predict life satisfaction, such as appearance, psychological symptoms, and physical activity. Young people probably seek obesity treatment primarily for psychological reasons or when their psychological symptoms worsen. In this sense, giving relevance to psychological aspects in treatment of overweight adolescents is an important health gain.

LIST OF ABBREVIATIONS

HBSC - Health Behaviour in School-Aged Children
BMI – Body Mass Index
PA – Physical Activity
TV - Television

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