

# Is subjective perception of negative body image among adolescents associated with bullying?

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**Abstract** Adolescents' body image dissatisfaction has an adverse effect on peer relationships. It may lead to changes in behaviour (aggressive or passive) and consequently to bullying behaviour. Our aim was to assess the association between body image dissatisfaction and involvement in bullying and whether this differs by gender. We used data from the Slovak part of the 2010 Health Behaviour in School-aged Children study. The final sample comprised 8050 adolescents aged 11 to 15 years old (mean age 13.57), less than half of whom were

boys. The association between self-reported body image and involvement in bullying was determined using multinomial logistic regression. We found a significant association between body dissatisfaction and involvement in bullying. Adolescents dissatisfied with their bodies because due to feeling overweight were more likely to become passive or reactive victims. Self-reported thinness was found to be significantly associated with bully-victims only in boys.

**Conclusion:** Adolescent body dissatisfaction is strongly associated with bullying behaviour. Our findings point out the importance of incorporating at schools different types of intervention programmes supporting positive self-perceptions of adolescents and reducing bullying behaviour.

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## What is known:

- *Involvement in bullying increases the risk of unhealthy development of adolescents.*
- *This study confirms previous evidence that adolescents dissatisfied with their bodies due to feeling overweight are more likely to be involved in bullying as passive or reactive victims.*

## What is new:

- *Negative body image because of thinness was found to be associated with bullying behaviour of adolescents.*
- *We found gender differences in the relationship between body image dissatisfaction and bullying behaviour: boys feeling too thin were at greater risk of becoming a reactive victim.*

**Keywords** Body image · Dissatisfaction · Bullying · Bully · Victim · Bully-victim

## Abbreviations

CIs	Confidence intervals
HBSC	Health Behaviour in School-aged Children
ORs	Odds ratios
SPSS	Statistical Package for the Social Sciences

## Introduction

Recent research shows that the experience of bullying perpetration and victimisation is prevalent among the population of school-aged children, but the prevalence rates differ between countries [9, 10, 12, 30]. Bullying has been defined as negative physical or verbal actions that have a hostile intent, cause distress to victims, are repeated over time and involve a power differential between bullies and their victims [32, 35].

Involvement in bullying during childhood and adolescence increases the risk of unhealthy development among bullies, victims and bully-victims [15]. This may concern psychosomatic problems, such as headache, stomach and back aches; psychological distress, such as depression, bad temper, loneliness [11], depression and suicide ideation [43] or substance use [31]. Recent research suggests a typology of three categories of adolescents involved in bullying—“bullies only”, “victims only” and “bully-victims” [41, 44]. Typical victims are more anxious and insecure than adolescents in general; they suffer from low self-esteem, and they experience significantly greater levels of depression and suicide ideation [43]. Bullies mostly have an aggressive reaction pattern [5] and negative attitudes and beliefs about others [8]. A typical bully-victim holds significantly negative attitudes and beliefs about himself or herself and others [8]. Overall, adolescents involved in bullying tend to have lower self-esteem than uninvolved adolescents, which is connected with poor interpersonal relationships and unpopularity in the peer group [24].

Body image dissatisfaction has been found to be strongly associated with bullying, particularly with victimisation [47], with bullying perpetration [37] and with an increased risk of aggression [40]. There is evidence that a preference for being of “average size” leads to a prejudice against thin and obese adolescents [18] and to the exclusion of, or aggressive behaviour towards these adolescents. Specifically, body image dissatisfaction is an aspect of being different and standing out. Sentenac et al. proposed two different hypotheses to explain why children differing from the general population are victimised. Firstly, because of the difference in their appearance or behaviours: deviation in physical appearance may be a reason to be picked on by peers and victimised. Secondly, psychosocial adjustment may influence the association between differences in appearance and victimisation. Low self-esteem or peer rejection-related concerns may result in exclusion or feelings of being a victim [39].

In 2010, obesity or overweight affected almost 10 % of school-aged children in Slovakia, and compared with 2005, the prevalence of childhood overweight doubled [27]. The association between body dissatisfaction and bullying has been studied mainly from the perspective of overweight. This evidence shows that overweight and also subjectively perceived overweight increases the chance of becoming a victim of bullying [6, 21, 29]. However, evidence on associations

between self-reported thinness and involvement in bullying as a victim in adolescence is rather scarce [37, 47].

The weight and shape of the body are valued differently by boys and girls [1]. Both overweight/obese and underweight boys are at risk for low self-reported quality of life [4, 23]. Girls have a tendency to report more negative body image than boys [46], and girls even in a healthy weight range may become increasingly at risk for weight and shape concerns potentially leading to negative body image [7]. This finding is consistent with the preference for a thin ideal in western European countries. However, the association of gender with negative body image might be mediated by different factors, e.g. parents' education, area of residence [46] or emotional symptoms [13].

Therefore, the objective of this study was to examine the relationship between body dissatisfaction and involvement in bullying overall and by gender. We expect that adolescents who are dissatisfied with their body shape both regarding underweight and overweight will be more likely to be involved in bullying perpetration or victimisation, and furthermore, that in girls, this tendency will be more pronounced because of their tendency to report a more negative body image.

## Material and methods

### Sample and procedure

We used data from the Health Behaviour in School-aged Children (HBSC) study conducted in 2010 in Slovakia. To obtain a representative sample, 134 larger and smaller schools located in rural as well as in urban areas from all regions of Slovakia were randomly selected from a list of all eligible schools in Slovakia obtained from the Slovak Institute of Information and Prognosis for Education and were asked to participate in the study. The school response rate (RR) was 98.1 %. We obtained data from 8050 adolescents from the fifth to ninth grades of elementary schools in Slovakia (RR, 79.5 %) in the target group of 11 to 15 years old (mean age 13.57; 48.3 % boys).

The study was approved by the Ethics Committee of the Medical Faculty at Pavol Jozef Safarik University in Kosice. Parents were informed about the study via the school administration and could opt out if they disagreed with their child's participation. Participation in the study was fully voluntary and anonymous with no explicit incentives provided for participation.

### Measures

The present study uses HBSC data related to adolescents' reports of bullying, victimisation and body image.

**Bullying** The role of the adolescent in bullying was measured by the revised Olweus Bully/Victim Questionnaire [42]. After

having read a standard definition of bullying, respondents were asked about their involvement in bullying—how often they had bullied others and had been bullied in school during the last few months. Responses were rated on a five-point scale (“I haven’t been bullied/bullied other students at school in the past couple of months”, “only once or twice”, “two or three times a month”, “about once a week”, “several times a week”). We chose the cut-off point of “two or three times a month”, and we dichotomized the responses to get four categories of bullying behaviour: being a bully, victim, bully-victim and not involved. This cut-off point indicates “chronic” bullying involvement and is widely used in a variety of reports and peer-review publications at national and cross-national levels [9, 19, 30].

**Body image** Body perception was measured using the question: “Do you think your body is...” Response categories were as follows: much too thin, a bit too thin, about the right size, a bit too fat or much too fat. We categorised responses to obtain three categories of body image: too thin (much too thin and a bit too thin), normal weight status (about the right size) and too fat (bit too fat and much too fat). This item has been developed by the HBSC consortium; a validation study of this measure is underway.

#### Statistical analyses

Firstly, we computed prevalence rates for levels of age, gender and self-reported body image by roles in bullying. Next, we assessed the association with bullying involvement of age, gender and self-reported body image by multinomial logistic regression, leading to odds ratios (ORs) and 95 % confidence intervals (CIs). This analysis was done by regressing bullying involvement separately with each independent variable (crude associations) and thereafter in a multivariable model that includes all variables contributing to the model with statistical significance. Third, we analysed the degree to which gender modified the effect of self-reported body image by adding their interactions to the multinomial logistic regression model.

In addition, we analysed the stratified effect of body image on bullying behaviour according to gender (Table 3). All data were analysed using IBM SPSS statistics 20.0 for Windows.

#### Results

More than 20 % of our sample reported being involved in bullying. The most prevalent reported role in bullying was being a bully. Regarding body image, more than half of the adolescents considered their bodies to be the right size. The rest of the sample reported dissatisfaction with their figure, considering their body to be either too thin or too fat. Results of the descriptive statistics are presented in Table 1. In general, boys were more likely to be involved in bullying (as bullies, victims and bully-victims) than girls. The association between involvement in bullying and age was significant regarding being a bully and being a victim: the probability of bullying others increased with age, while the prevalence of reports of being a victim decreased with age.

The results of the multinomial logistic regression showed that adolescents who reported dissatisfaction with their body image (feeling either too thin or too fat) were more likely to become bully-victims. Being a target of a bullying-victim was connected with self-reported overweight. Being a bully was not associated with body image (Table 2). We found a statistically significant interaction between gender and body image regarding their association with bullying behaviour (Table 2, bottom row).

We therefore repeated the analyses with stratification for gender among the bully-victims (Table 3). The association between feeling too thin or too fat with being a bully-victim was statistically significant. The relationship of being a bully-victim and self-reported overweight was significant at the level  $p < 0.001$  and the connection with thinness at  $p < 0.05$ . After stratification for gender, the association between being a bully-victim and self-reported thinness disappeared among girls and became strongly significant among boys.

**Table 1** Gender and self-reported body image of the total sample and by involvement in bullying: numbers and percentages

	Total sample <i>N</i> =8050 (100 %)	Bully <i>N</i> =767 (9.8 %)	Victim <i>N</i> =515 (6.6 %)	Bully-victim <i>N</i> =293 (3.8 %)	Not involved <i>N</i> =6234 (79.8 %)
Gender					
Boys	3910 (48.6)	454 (12.1)	259 (6.9)	179 (4.7)	2876 (76.3)
Girls	4132 (51.4)	310 (7.7)	255 (6.3)	114 (2.8)	3352 (83.2)
Self-reported body image					
Too thin	1563 (19.6)	139 (18.2)	99 (19.3)	64 (22.0)	1226 (19.8)
Too fat	1901 (23.9)	173 (22.6)	173 (33.8)	96 (33.0)	1410 (22.8)
Normal	4503 (56.5)	452 (59.2)	240 (46.9)	131 (45.0)	3555 (57.4)

Number of missing values: role in bullying *N*=241 (3 %), gender *N*=8 (0.1 %) and self-reported body image *N*=83 (1 %)

**Table 2** The effects of self-reported body image, gender, age and the interaction of gender×body image and age×body image on involvement in bullying among adolescents: ORs and 95 % CIs in parentheses

	Bully		Victim		Bully-victim	
	Crude OR (95 % CI)	Adjusted OR (95 % CI)	Crude OR (95 % CI)	Adjusted OR (95 % CI)	Crude OR (95 % CI)	Adjusted OR (95 % CI)
Gender						
Girls	1 (ref)					
Boys	<i>1.71 (1.47–1.99)**</i>	<i>1.70 (1.46–1.99)**</i>	<i>1.18 (0.98–1.41)</i>	<i>1.25 (1.04–1.50)*</i>	<i>1.83 (1.43–2.32)**</i>	<i>1.92 (1.51–2.45)**</i>
Age	<i>1.16 (1.09–1.22)**</i>	<i>1.15 (1.09–1.22)**</i>	<i>0.84 (0.78–0.89)**</i>	<i>0.83 (0.78–0.89)**</i>	<i>0.91 (0.84–1.00)</i>	<i>0.91 (0.84–1.00)</i>
Self-reported body image						
Normal	1 (ref)					
Too thin	<i>0.89 (0.72–1.09)</i>	<i>0.89 (0.72–1.09)</i>	<i>1.19 (0.93–1.52)</i>	<i>1.21 (0.95–1.54)</i>	<i>1.41 (1.04–1.92)*</i>	<i>1.43 (1.05–1.95)*</i>
Too fat	<i>0.96 (0.80–1.16)</i>	<i>1.02 (0.85–1.23)</i>	<i>1.81 (1.48–2.23)**</i>	<i>1.88 (1.53–2.31)**</i>	<i>1.84 (1.41–2.42)**</i>	<i>1.98 (1.51–2.60)**</i>
Interaction						
Self-reported body image×gender		NS		NS		**

Differences and overall models which are statistically significant ( $p < 0.05$ ) are in italics. Odds ratios as shown have not been adjusted for the interaction

NS not statistically significant at level  $p < 0.05$

\* $p < 0.05$ ; \*\* $p < 0.001$

**Table 3** Difference between boys and girls in involvement in the role of bully-victim by self-reported body image, associated ORs and 95 % CIs

	Boys OR (95 % CI)	Girls OR (95 % CI)
Self-reported body image		
Normal	1 (ref)	1 (ref)
Too thin	<i>1.85 (1.27–2.68)**</i>	0.86 (0.49–1.52)
Too fat	<i>1.96 (1.36–2.84)**</i>	<i>1.88 (1.25–2.82)*</i>

Differences and overall models which are statistically significant ( $p < 0.05$ ) are in italics

NS not statistically significant at level  $p < 0.05$

\* $p < 0.01$ ; \*\* $p < 0.001$

## Discussion

The aim of the present study was to examine the relationship between a negative body image and involvement in bullying as well as the gender differences in this relationship. We found that adolescents reporting a negative body image—those who consider themselves to be too fat—were more likely to be victims and bully-victims. Self-reported thinness was associated with being a bully-victim only in boys. Contrary to our expectations, we found no association between negative body image and bullying others.

Previous research has documented well the vulnerability of adolescents reporting overweight, obesity, [6, 14, 21, 29] or feelings of overweight [39, 47] to becoming victims of bullying, which is in line with our results. Low self-esteem and the different appearance of these adolescents can lead to their becoming easy targets for the aggressive behaviour of others or feelings of being a victim [39]. Furthermore, we found that adolescents with a negative body image due to feeling too fat were found to be significantly more frequently bully-victims. In other words, these adolescents were more vulnerable to becoming victims and bullies than adolescents with a positive body image. The mixed effect of the different appearance, low self-esteem and social dysfunction of these adolescents may result in these adolescents becoming a bully-victim.

Self-reported thinness was related to a greater risk of becoming a bully-victim among boys, while this relationship was not significant among girls. To our knowledge, there is no previous evidence about the association between self-reported thinness and aggressive behaviour. An explanation for our finding may be the current ideal of a thin female and a muscular male [28]. This may be summarised like this: that thinness among boys indicates weakness, while girls are under the pressure of the slim ideal [6]. In line with this, boys dissatisfied with their bodies because of thinness are more vulnerable to suffering from mental and behavioural problems, leading to aggressive behaviour. In connection with their physical weakness the likelihood of becoming the target of

bullying increases, and they are at risk of entering into the category of bully-victims.

The current study also showed that adolescents involved in bullying as bullies do not report a negative body image nor were gender differences found, which is in accordance with previous evidence. Bullies were found to have a lower level of psychosomatic problems [20] and higher self-esteem than other adolescents involved in bullying [3, 22, 34, 36]. In addition, recent finding suggests that bullies rate themselves as having a better physical appearance [34]. On the other hand, it has been well documented that bullies report higher rates of psychosocial problems [2, 16, 26] and lower self-esteem [38] than uninvolved adolescents. Apparently, previous evidence about the psychosocial characteristics of bullies is not consistent. Pollastri et al. suggest that these inconsistencies are due to the fact that previous classifications also included bully-victims in to the category of bullies, whereas these have a different psychosocial background than bullies [36].

## Strengths and limitation

The major strengths of our study are that it concerns a large and representative sample of Slovak adolescents aged 11 to 15 years and has a high response rate. In addition, we used frequently applied measures for bullying, e.g. in the HBSC survey and in a variety of reports and peer-review publications at national and cross-national levels [6, 9, 19, 30].

A limitation is the cross-sectional design, which limits the potential for making causal inferences. A second limitation of our study is the use of self-report measures for assessing bullying behaviour. The question for assessing body image has not yet been validated. Its validity should be confirmed in future research.

## Implications

Our results imply that bullying prevention and intervention programmes at schools should also address body image. The target group should include all adolescents, not only those who are dissatisfied with their body image. Media literacy interventions may be useful tools for protecting young girls and boys from body dissatisfaction [17]. In synergy with other types of intervention, we could decrease the prevalence of body dissatisfaction-related problems among adolescence.

By decreasing the prevalence of bullying based on body dissatisfaction, it is possible to reduce the likelihood of various consequences of this type of aggressive behaviour: psychosomatic problems; psychological distress; risk behaviours, such as aggression, violence or substance use; serious anti-social problems in adolescence [33] or becoming mothers in adolescence among girls [25].

Our findings need confirmation, preferably in research that assesses bullying behaviour via techniques such as peer

nominations for bullying and victimisation [45]. It should focus on the identification of specific forms of weight-based bullying, taking into account the self-esteem of adolescents in order to help school staff and parents to reveal bullying in an early stage and intervene in an appropriate way. To disentangle causality, we need future longitudinal research or trend analyses on the relations between bullying behaviour and body dissatisfaction.

## Conclusion

To sum up, our study shows an association between body dissatisfaction and involvement in bullying. Self-reported feelings of overweight were found to be strongly connected with involvement in bullying as a victim and bully-victim among boys and girls. Gender differences emerged in the bully-victim category; boys feeling too thin were more likely to become bully-victims, unlike girls. Since negative body image and bullying are frequent among adolescents, further research is necessary to investigate the causal mechanism.

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**Ethical standards** The study was approved by the Ethics Committee of the Medical Faculty at Pavol Jozef Safarik University in Kosice and was therefore performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Parents of respondents were informed about the study via the school administration; they gave their informed consent prior to inclusion of their children in the study and could opt out if they disagreed with their child’s participation. Participation in the study was fully voluntary and anonymous with no explicit incentives provided for participation.

**Conflict of interest** The authors do not have any conflict of interest in connection with the current paper.

**Author’s contributions** Jana Holubicikova drafted the initial manuscript, carried out the initial analyses and revised the final manuscript as submitted. Jitse P. van Dijk revised the manuscript and approved the final manuscript as submitted. Andrea Madarasova Geckova, Sijmen A. Reijneveld and Peter Kolarcik revised the analyses and the final manuscript and approved the final manuscript as submitted.

## References

- Al Sabbah H, Vereecken CA, Elgar FJ, Nansel T, Aasvee K, Abdeen Z, Ojala K, Ahluwalia N, Maes L (2009) Body weight dissatisfaction and communication with parents among adolescents in 24 countries: international cross-sectional survey. *BMC Public Health* 9:1–10
- Alikasifoglu M, Erginoz E, Ercan O, Uysal O, Albayrak-Kaymak D (2007) Bullying behaviours and psychosocial health: results from a cross-sectional survey among high school students in Istanbul, Turkey. *Eur J Pediatr* 166:1253–1260
- Andreou E (2000) Bully/victim problems and their association with psychological constructs in 8- to 12-year-old Greek schoolchildren. *Aggress Behav* 26:49–56
- Bonsergent E, Benie-Bi J, Baumann C, Agrinier N, Tessier S, Thilly N, Briançon S (2012) Effect of gender on the association between weight status and health-related quality of life in adolescents. *BMC Public Health* 12:997–1004
- Book AS, Volk AA, Hosker A (2012) Adolescent bullying and personality: an adaptive approach. *Pers Individ Differ* 52:218–223
- Brixval CS, Rayce SLB, Rasmussen M, Holstein BE, Due P (2012) Overweight, body image and bullying—an epidemiological study of 11- to 15-years olds. *Eur J Public Health* 22:126–130
- Calzo JP, Sonnevile KR, Haines J, Blood EA, Field AE, Austin SB (2012) The development of associations among body mass index, body dissatisfaction, and weight and shape concern in adolescent boys and girls. *J Adolesc Health* 51:517–523
- Cook CR, Williams KR, Guerra NG, Kim TE, Sadek S (2010) Predictors of bullying and victimization in childhood and adolescence: a meta-analytic investigation. *School Psychol Q* 25:65–83
- Craig W, Harel-Fisch Y, Fogel-Grinvald H, Dostaler S, Hetland J, Simons-Morton B, Molcho M, de Mato MG, Overpeck M, Due P, Pickett W (2009) A cross-national profile of bullying and victimization among adolescents in 40 countries. *Int J Public Health* 54(Suppl 2):216–224
- DeVoe JF, Bauer L, National Center for Education Statistics (2011) Student victimization in U.S. schools: results from the 2009 School Crime Supplement to the National Crime Victimization Survey. NCES 2012-314. National Center for Education Statistics
- Due P, Holstein BE, Lynch J, Diderichsen F, Gabhain SN, Scheidt P, Currie C (2005) Bullying and symptoms among school-aged children: international comparative cross sectional study in 28 countries. *Eur J Public Health* 15:128–132
- Eaton DK, Kann L, Kinchen S, Shanklin S, Flint KH, Hawkins J, Harris WA, Lowry R, Mcmanus T, Chyen D, Whittle L, Lim C, Wechsler H (2012) Youth risk behavior surveillance—United States, 2011. *MMWR Surveill Summ* 61:1–162
- Farrow CV, Fox CL (2011) Gender differences in the relationships between bullying at school and unhealthy eating and shape-related attitudes and behaviours. *Br J Educ Psychol* 81:409–420
- Fox CL, Farrow CV (2009) Global and physical self-esteem and body dissatisfaction as mediators of the relationship between weight status and being a victim of bullying. *J Adolesc* 32:1287–1301
- Gini G, Pozzoli T (2009) Association between bullying and psychosomatic problems: a meta-analysis. *Pediatrics* 123:1059–1065
- Gobina I, Zaborskis A, Pudule I, Kalnins I, Villerusa A (2008) Bullying and subjective health among adolescents at schools in Latvia and Lithuania. *Int J Public Health* 53:272–276
- Halliwel E, Easun A, Harcourt D (2011) Body dissatisfaction: Can a short media literacy message reduce negative media exposure effects amongst adolescent girls? *Br J Health Psychol* 16:396–403
- Hansson LM, Karnehed N, Tynelius P, Rasmussen F (2009) Prejudice against obesity among 10-year-olds: a nationwide population-based study. *Acta Paediatr* 98:1176–1182
- Harel-Fisch Y, Walsh SD, Fogel-Grinvald H, Amitai G, Pickett W, Molcho M, Due P, de Matos MG, Craig W (2011) Negative school perceptions and involvement in school bullying: a universal relationship across 40 countries. *J Adolesc* 34:639–652
- Isolan L, Salum G, Osowski A, Zottis G, Manfro G (2013) Victims and bully-victims but not bullies are groups associated with anxiety symptomatology among Brazilian children and adolescents. *Eur Child Adolesc Psychiatry* 22:641–648

21. Janssen I, Craig WM, Boyce WF, Pickett W (2004) Associations between overweight and obesity with bullying behaviors in school-aged children. *Pediatrics* 113:1187–1194
22. Juvonen J, Graham S, Schuster MA (2003) Bullying among young adolescents: the strong, the weak, and the troubled. *Pediatrics* 112: 1231–1237
23. Lawler M, Nixon E (2011) Body dissatisfaction among adolescent boys and girls: the effects of body mass, peer appearance culture and internalization of appearance ideals. *J Youth Adolesc* 40:59–71
24. Lee J (2012) The relationship between appearance-related stress and internalizing problems in South Korean adolescent girls. *Soc Behav Pers* 40:903–918
25. Lehti V, Sourander A, Klomek A, Niemelä S, Sillanmäki L, Piha J, Kumpulainen K, Tamminen T, Moilanen I, Almqvist F (2011) Childhood bullying as a predictor for becoming a teenage mother in Finland. *Eur Child Adolesc Psychiatry* 20:49–55
26. Lien L, Green K, Welander-Vatn A, Bjertness E (2009) Mental and somatic health complaints associated with school bullying between 10th and 12th grade students; results from cross sectional studies in Oslo, Norway. *Clin Pract Epidemiol Ment Health* 5:1–8
27. Madarasova Geckova A, Veselska Z, Kollarova J (2011) Social determinants of health of school-aged children. National report on health and health-related behavior of 11, 13 and 15 year old schoolchildren, based on a survey conducted in 2009/2010 in the framework of the international project “Health Behaviour in School Aged Children” [in Slovak]. Equilibria, Kosice
28. McCabe MP, Mavoa H, Ricciardelli LA, Schultz JT, Waqa G, Fotu KF (2011) Socio-cultural agents and their impact on body image and body change strategies among adolescents in Fiji, Tonga, Tongans in New Zealand and Australia. *Obes Rev* 12:61–67
29. Midei AJ, Matthews KA (2011) Interpersonal violence in childhood as a risk factor for obesity: a systematic review of the literature and proposed pathways. *Obes Rev* 12:e159–e172
30. Molcho M, Craig W, Due P, Pickett W, Harel-Fisch Y, Overpeck M (2009) Cross-national time trends in bullying behaviour 1994–2006: findings from Europe and North America. *Int J Public Health* 54(Suppl 2):225–234
31. Molcho M, Harel Y, Dina LO (2004) Substance use and youth violence. A study among 6th to 10th grade Israeli school children. *Int J Adolesc Med Health* 16:239–251
32. Olweus D (1991) Bully/victim problems among school children: some basic facts and effects of a school-based intervention program. In: Pepler D, Rubin K (eds) *The development and treatment of childhood aggression*. Erlbaum, Hillsdale, pp 411–488
33. Olweus D (2011) Bullying at school and later criminality: findings from three Swedish community samples of males. *Crim Behav Ment Health* 21:151–156
34. O'Moore M, Kirkham C (2001) Self-esteem and its relationship to bullying behaviour. *Aggress Behav* 27:269–283
35. Pepler DJ, Craig WM (2000) *Making a difference in bullying*. LaMarsh Centre for Research on Violence and Conflict Resolution. York University, Toronto
36. Pollastri AR, Cardemil EV, O'Donnell E (2010) Self-esteem in pure bullies and bully/victims: a longitudinal analysis. *J Interpers Violence* 25:1489–1502
37. Reulbach U, Ladewig EL, Nixon E, O'Moore M, Williams J, O'Dowd T (2013) Weight, body image and bullying in 9-year-old children. *J Paediatr Child Health* 49:E288–E293
38. Seals D, Young J (2003) Bullying and victimization: prevalence and relationship to gender, grade level, ethnicity, self-esteem, and depression. *Adolescence* 38:735–747
39. Sentenac M, Arnaud C, Gavin A, Molcho M, Gabhainn SN, Godeau E (2012) Peer victimization among school-aged children with chronic conditions. *Epidemiol Rev* 34:120–128
40. Shelton S, Liljequist L (2002) Characteristics and behaviors associated with body image in male domestic violence offenders. *Eat Behav* 3:217–227
41. Solberg ME, Olweus D, Endresen IM (2007) Bullies and victims at school: are they the same pupils? *Br J Educ Psychol* 77:441–464
42. Solberg ME, Olweus D (2003) Prevalence estimation of school bullying with the Olweus Bully/Victim Questionnaire. *Aggress Behav* 29:239–268
43. Turner MG, Exum ML, Brame R, Holt TJ (2013) Bullying victimization and adolescent mental health: general and typological effects across sex. *J Crime Justice* 41:53–59
44. Veenstra R, Lindenberg S, Oldehinkel AJ, De Winter AF, Verhulst FC, Ormel J (2005) Bullying and victimization in elementary schools: a comparison of bullies, victims, bully/victims, and uninvolved preadolescents. *Dev Psychol* 41:672–682
45. Verlinden M, Veenstra R, Ringoot AP, Jansen PW, Raat H, Hofman A, Jaddoe VWV, Verhulst FC, Tiemeier H (2014) detecting bullying in early elementary school with a computerized peer-nomination instrument. *Psychol Assess* 26:628–641
46. Vilhjálmsdóttir R, Kristjansdóttir G, Ward DS (2012) Bodily Deviations and body image in adolescence. *Youth Soc* 44:366–384
47. Wilson ML, Viswanathan B, Rousson V, Bovet P (2013) Weight status, body image and bullying among adolescents in the Seychelles. *Int J Environ Res Public Health* 10:1763–1774