



Trabajo Original

Perception of obese schoolchildren regarding their participation in the Physical Education class and their level of self-esteem: comparison according to corporal status

Percepción de los escolares obesos con respecto a su participación en la clase de Educación Física y su nivel de autoestima: comparación según el estado corporal

Pedro Delgado-Floody¹, Alfonso Cofré-Lizama^{2,3}, Iris Paola Guzmán-Guzmán⁴, Daniel Jerez Mayorga⁵, Cristian Martínez-Salazar¹ and Felipe Caamaño-Navarrete⁶

¹Department of Physical Education, Sports and Recreation. Universidad de La Frontera. Temuco, Chile. ²School of Psychology. Faculty of Social Sciences. Universidad Santo Tomás. Temuco, Chile. ³Universidad Mayor. Chile. ⁴Faculty of Biological Chemistry Sciences. Universidad Autónoma de Guerrero. Guerrero, México. ⁵Faculty of Rehabilitation Sciences. Universidad Andres Bello. Santiago, Chile. ⁶Physical Education Pedagogy. Faculty of Education. Universidad Católica de Temuco. Temuco, Chile

Abstract

Background: adequate exposure to Physical Education (PE) classes contributes to a healthier lifestyle among children during their lifespan.

Objective: the main objective of this research was to evaluate the perception of obese schoolchildren regarding their participation in PE class and to determine their self-esteem compared with overweight and normal weight groups.

Method: in total, 656 schoolchildren (284 females and 372 males), between eleven and 14 years of age, participated in this study. Assessments were made regarding age, sex, anthropometric variables, children's self-esteem, and perception of participation in the PE class.

Results: obese schoolchildren presented significantly lower values of self-esteem ($p < 0.001$), and exhibited the highest proportion of schoolchildren with low self-esteem (53%). There was a significant relationship between obesity and the following sentence: "I am the last one they choose for games and in games and sports"; 48.53% of schoolchildren with obesity responded positively. With the following sentence: "I look instead of playing", 57.4% of schoolchildren with obesity responded positively.

Conclusion: the results revealed that schoolchildren with obesity feel excluded from PE classes and show low levels of self-esteem, compared with normal weight schoolchildren.

Key words:

Schoolchildren.
Physical Education.
Self-esteem. Obesity.

Resumen

Antecedentes: la exposición adecuada a las clases de Educación Física contribuye a un estilo de vida más saludable entre los niños durante su vida.

Objetivo: el objetivo principal de esta investigación fue evaluar la percepción de los escolares obesos con respecto a su participación en la clase de Educación Física y determinar su autoestima en comparación con los grupos con sobrepeso y peso normal.

Método: en total, 656 escolares (284 mujeres y 372 varones) de entre once y 14 años de edad participaron en este estudio. Las evaluaciones se hicieron con respecto a la edad, el sexo, las variables antropométricas, la autoestima de los niños y la percepción de la participación en la clase de Educación Física.

Resultados: los escolares obesos presentaron valores de autoestima significativamente menores ($p < 0,001$) y exhibieron la mayor proporción de escolares con baja autoestima (53%). Hubo una relación significativa entre la obesidad y la siguiente frase: "Soy el último que eligen para juegos y en los juegos y deportes"; el 48,53% de los escolares con obesidad respondieron positivamente. Con respecto a la oración "Miro en lugar de jugar", el 57,4% de los escolares con obesidad respondieron positivamente.

Conclusión: los resultados revelaron que los escolares con obesidad se sienten excluidos de las clases de Educación Física y muestran bajos niveles de autoestima en comparación con los escolares de peso normal.

Palabras clave:

Escolares. Educación Física. Autoestima. Obesidad.

Received: 18/01/2018 • Accepted: 04/03/2018

Delgado-Floody P, Cofré-Lizama A, Guzmán-Guzmán IP, Jerez Mayorga D, Martínez-Salazar C, Caamaño-Navarrete F. Perception of obese schoolchildren regarding their participation in the Physical Education class and their level of self-esteem: comparison according to corporal status. *Nutr Hosp* 2018;35(6):1270-1274

DOI: <http://dx.doi.org/10.20960/nh.1786>

Correspondence:

Pedro Delgado-Floody. Department of Physical Education, Sports and Recreation. Universidad de La Frontera. Av. Francisco Salazar. 01145 Temuco, Chile
e-mail: pedro.delgado@ufrontera.cl

INTRODUCTION

Childhood obesity has become a global public health problem of growing concern in industrialized nations (1,2), around 55% of obese children go on to be obese in adolescence and around 80% of obese adolescents will still be obese in adulthood (3). In general, overweight and obesity are assumed to be the result of an increase in caloric and fat intake. On the other hand, there is supporting evidence that excessive sugar intake by soft drinks, increased portion size, and steady decline in physical activity have been playing major roles in the rising rates of obesity all around the world (4). This situation has worsened over the years, primarily because children engage in academic activities more often than in activities which generate physical and psychosocial well-being.

School-age obesity is associated with psychosocial problems such as deficiencies in social co-existence and quality of life (5). It has been observed that obese children tend to have affective problems, mainly low self-esteem, body dissatisfaction, and depression (5-9), which affect their academic performance, as well as social and family interactions. In addition, obese children with declining levels of self-esteem present significantly higher rates of sadness, loneliness, and anxiety, and are more likely to engage in high-risk behaviors such as smoking or alcohol consumption (10). Therefore, diagnosis, prevention, and treatment are common health policies in many countries, making research on their characteristics a priority.

Children with emotional and behavioral problems have a high risk of academic failure (11), which is evident in Primary school. With the added problems of self-esteem produced by childhood obesity (12), the situation becomes more complex due to high percentages of obese schoolchildren globally. Therefore, their participation in the Physical Education (PE) class is affected, generating a vicious circle of sedentary lifestyle.

An effective strategy for the prevention and treatment of childhood obesity includes a modification of PE curricula in schools, which has demonstrated consistent changes in the quantity of physical activity (PA) and student motivation, producing beneficial effects on quality of life (13) as well as other biomarkers (14,15). Adequate exposure to PE effectively contributes to a healthier lifestyle of children during their lifespan. However, many PE programs do not comply with recommendations in terms of class times and intensity (16) and do not exhibit equal participation of all students. In many cases, obese children are excluded and these participants perceive the PE classes to be too competitive and demotivating (17). However, there is no clearly established evidence to corroborate the perception of overweight and obese schoolchildren regarding their participation in the PE class. Therefore, the main objective of this study was to evaluate the perception of obese schoolchildren concerning their participation in PE class and to determine their self-esteem compared with overweight and normal weight groups.

MATERIAL AND METHODS

This cross-sectional study involved 656 schoolchildren, 284 females (43%) and 372 males (57%), between eleven and 14 years of age, from the Araucania region (Chile). The sample was selected for convenience purposes, and assessments were made regarding age, sex, anthropometric variables, self-esteem, and perception of participation in PE class.

Inclusion criteria required that participants presented informed consent from their parents and themselves to take part in the study, be enrolled in the school being studied, and be between eleven and 14 years of age. Students with physical, sensory, or intellectual disabilities were excluded.

INSTRUMENTS

Body mass (kg) was evaluated using a Tanita scale, Scale Plus model UM-028 (Tokyo, Japan). Students were evaluated with bare feet and with the least amount of clothing possible. Size (m) was estimated with a Seca® model 214 height rod (Hamburg, Germany), graduated in mm. Body mass index (BMI), obtained by dividing body weight by size in square meters (kg/m^2), was used to estimate the degree of obesity according to the international rating criteria provided by the Center for Disease Control and Prevention to verify corresponding ages and percentiles related to sex. Childhood obesity is defined as having a BMI equal to or greater than the 95th percentile for children of the same age and sex, and being overweight is defined as having a BMI between the 85th and the 95th percentile (2).

Waist circumference (WC) was measured using a Seca® model 201 (Hamburg, Germany) tape measure at umbilical scar level (18). The waist to height ratio (WHtR) was obtained by dividing the WC by the height and is used as a tool to estimate fat accumulation in the central area of the body. A ratio greater than 0.5 indicates an increased cardiometabolic risk (19).

To measure self-esteem, the TAE-Student: Self-Esteem Test (20) was used, via a general self-report in relation to norms established by age. A point is added for each positive answer and 0 points are awarded for negative answers. The sum of the gross score is transformed to a T score according to norms by age. The students are then identified according to the following categories: normal self-esteem = score \geq 40 points; low self-esteem = score between 30 and 39 points; and very low self-esteem = score \leq 29 points. The level of internal consistency reached in this questionnaire presented a Cronbach's alpha = 0.83.

Two questions from the TAE-Student test were selected to determine the participation of children in PE classes:

- "In PE class...
- I'm the last one they choose for games."
- In games and sports, I look instead of playing."

PROCEDURE

Previously trained research assistants visited selected schools during the 2017 Chilean school year and carried out the assessments on the children who presented parental and their own consent. Anthropometric assessments were carried out in a favorable space facilitated by the school with optimum temperature and reliable privacy. The evaluations took place during Physical Education classes and in the morning.

STATISTICAL ANALYSIS

The statistical analysis was performed with the SPSS v 23.0 software. The continuous variables showed parametric distributions and were expressed as the mean \pm standard deviation. Between-group differences were determined using a one-way analysis of variance (ANOVA). To compare weight groups, ANOVA was conducted with a post-hoc analysis (Bonferroni method). A Chi-square test was performed for the comparison of proportions between groups. A p-value < 0.05 was considered as statistically significant.

RESULTS

There were no differences between the proportions by corporal status between boys and girls ($p = 0.746$). Self-esteem ($p = 0.018$) was higher in boys (Table I).

Overall, 45% of participants were normal weight ($n = 292$), 35% were overweight ($n = 228$), and 20% were obese ($n = 136$). Obese schoolchildren presented significantly lower levels of self-esteem, followed by the overweight group (Table II). Obese schoolchildren had the highest proportion of schoolchildren with low self-esteem (53%), followed by the overweight group (32%), and finally the normal weight group (22%) ($p < 0.001$) (Fig. 1).

There was a relationship between obesity and the following sentence: "I am the last one they choose for games and in games and sports". In total, 48.53% of obese schoolchildren answered affirmatively, followed by 29.8% for the overweight group and 28.1% for the normal weight group ($p < 0.001$) (Fig. 2). With respect to the sentence "In games and sports, I look instead of playing", 57.4% of obese schoolchildren responded positively, compared with 34.6% of the overweight group ($p = 0.024$) (Fig. 3).

Table I. Comparison of study variables according to sex

	Total (n = 656)	Male (n = 372)	Female (n = 284)	p-value
Age (years)	12.40 \pm 1.14	12.36 \pm 1.14	12.43 \pm 1.13	0.453
BM (kg)	56.77 \pm 12.46	57.54 \pm 13.95	55.75 \pm 10.20	0.346
Size (m)	1.57 \pm 0.09	1.59 \pm 0.10	1.55 \pm 0.07	0.003
BMI (kg/m ²)	22.84 \pm 3.68	22.57 \pm 4.00	23.20 \pm 3.20	0.125
WC (cm)	72.80 \pm 9.34	73.74 \pm 9.56	71.56 \pm 8.95	0.147
WHR (WC/size)	0.46 \pm 0.05	0.46 \pm 0.06	0.46 \pm 0.05	0.838
Self-esteem (score)	48.26 \pm 11.97	50.61 \pm 12.10	45.17 \pm 11.14	0.018

The values shown represent the mean \pm standard deviation; p values < 0.05 are statistically significant. BM: body mass; BMI: body mass index; WC: waist circumference; and WHtR: waist-to-height ratio.

Table II. Comparison of variables according to corporal status

	Normal (n = 292)	Overweight (n = 228)	Obese (n = 136)	p-value
Age (years)	12.33 \pm 1.11	12.79 \pm 1.11	12.65 \pm 1.23	0.250
BM (kg)	48.33 \pm 7.19*	60.31 \pm 7.25 [†]	71.03 \pm 11.06 [‡]	< 0.001
Size (m)	1.55 \pm 0.10*	1.60 \pm 0.09 [†]	1.58 \pm 0.08 [‡]	0.002
BMI (kg/m ²)	20.06 \pm 1.50*	23.58 \pm 1.26 [†]	28.22 \pm 2.39 [‡]	< 0.001
WC (cm)	66.40 \pm 5.02*	74.28 \pm 5.27 [†]	85.06 \pm 7.89 [‡]	< 0.001
WHR (WC/size)	0.43 \pm 0.03*	0.47 \pm 0.03 [†]	0.54 \pm 0.04 [‡]	< 0.001
Self-esteem (score)	50.61 \pm 12.21*	48.19 \pm 0.44 [†]	45.21 \pm 13.43 [‡]	0.004

The values shown represent the mean \pm standard deviation; p values < 0.05 are statistically significant. Different superscript symbols indicate differences between groups. BM: body mass; BMI: body mass index; WC: waist circumference; and WHtR: waist-to-height ratio.

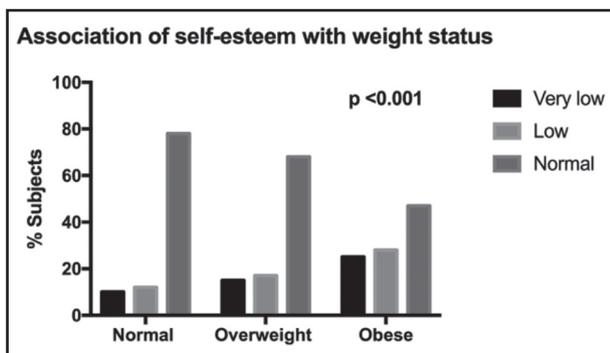


Figure 1.
Comparison of self-esteem according to corporal status.

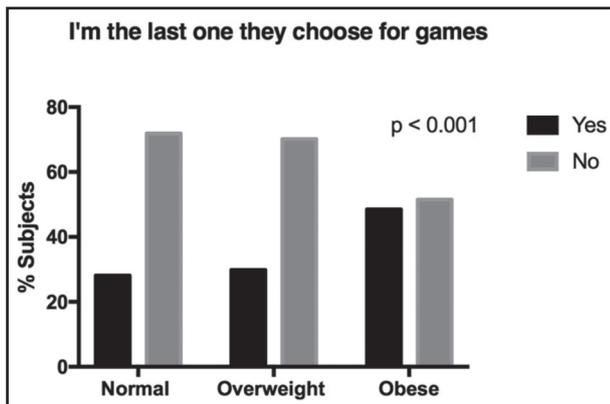


Figure 2.
Comparison according to corporal status in relation to the Physical Education class: "I'm the last one they choose for game."

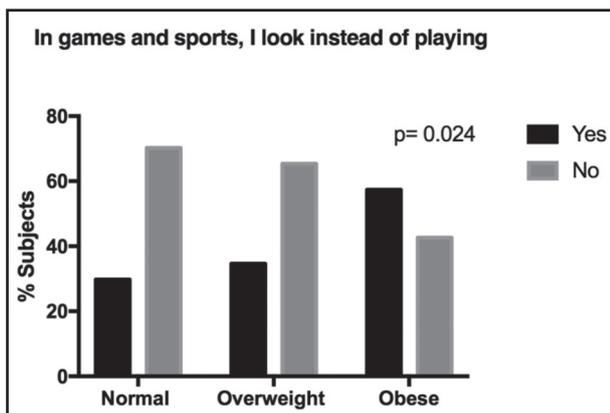


Figure 3.
Comparison according to corporal status in relation to the Physical Education class: "In games and sports, I look instead of playing."

DISCUSSION

The primary objective of this research was to evaluate the perception of obese schoolchildren concerning their participation in PE classes, and to determine their self-esteem compared with overweight and normal weight groups. Our primary finding is that schoolchildren with obesity showed lower levels of self-esteem and felt excluded in PE classes.

In this study, obese schoolchildren perceived a low participation in PE classes. Additionally, they felt that they were the last one chosen for games and sports and watched while others played. These results are similar to those reported in another sample of schoolchildren, where those classified as overweight and obese had lower levels of self-esteem, specifically with respect to athletic competition and physical appearance compared with students classified as normal weight (21). This shows that PE classes are not integrative and inclusive; on the contrary, those who are overweight and obese feel discriminated against. However, the research reported that providing a supportive PE class environment that promotes equality can potentially increase the enjoyment of PE class among youth (22). Since PE programs aim to promote PA and reach most school-aged youth (20), this is a major concern, because obesity is perceived as a barrier to participation in PE class.

The declining time for PE observed in Latin American schools may play an important role in the prevalence of overweight and obese schoolchildren in Latin America (23). Because students spend large amounts of time at school, there is great potential for increasing energy expenditure through school-based programs and well-structured lessons, providing substantial opportunities to increase moderate-to-vigorous PA. Given that overweight and obese children need support and encouragement to exercise, PE in school represents a major context where the enjoyment of exercise should be stimulated (17). The main elements of the positive interventions in PE class have included staff capacitating (PE specialists and/or classroom teachers), changes in the PE curricula, provision of equipment and materials, and adjustment of the interventions to target specific populations (23). Some studies have shown that schools have made progress in improving school-provided food and physical activity environments but that much more work is needed (24), specifically with respect to inclusion in PE classes for schoolchildren with obesity.

In this study, a high percentage of obese students had low or very low self-esteem, which suggests that obesity is associated with low or very low self-esteem. In children, a differential effect of obesity on self-esteem has been observed in problems of externalization and social perception related to bullying behaviors (25). Research conducted in Australian students of a similar age to those in the present study reported that obesity affects the self-perception of children who enter adolescence, especially for females (26). Low self-esteem is a negative result since it is associated with family problems, less perceived social support and depression, and is considered to be a predictor of higher suicide rates (27-29). Conversely, higher self-esteem was related to many positive mental health aspects such as positive perceptions, academic achievements, and persistence (12).

Finally, an important point of the present study is that self-esteem was higher in boys, consistent with results of a study conducted with a sample of students from public schools in Norway (30,31) and in Britain (32). Low levels of self-esteem have a negative role in association with adolescents' life dissatisfaction, and negative emotional health and well-being, and this relationship is equally strong regardless of gender and age.

LIMITATIONS

The main limitation of the current study is not to compare the perception of obese schoolchildren about their PE class involvement with data from any valid and direct method of assessment (i.e., participation and intensity). Additionally, the involvement during the PE classes and self-esteem levels were not controlled according to PA levels. Altogether will be controlled in future studies.

CONCLUSION

The results of this study revealed that schoolchildren with obesity feel excluded from PE classes, and show low levels of self-esteem, compared with normal weight groups. It is important to consider that today's education seeks to carry out integrative and inclusive activities, where everyone can participate. If we consider that PE classes are key to the development of a healthy life in the future, the present investigation shows that in this study, schoolchildren with obesity do not feel integrated in the classes, therefore, would not be fulfilling the objectives of this subject.

REFERENCES

- Ogden CL, Carroll MD, Curtin LR, Lamb MM, Flegal KM. Prevalence of high body mass index in US children and adolescents, 2007-2008. *JAMA* 2010;303(3):242-9.
- Karnik S, Kanekar A. Childhood obesity: a global public health crisis. *Int J Prev Med* 2012;3(1):1-7.
- Simmonds M, Llewellyn A, Owen C, Woolacott N. Predicting adult obesity from childhood obesity: a systematic review and meta-analysis. *Obes Rev* 2016;17(2):95-107.
- Sahoo K, Sahoo B, Choudhury AK, Sofi NY, Kumar R, Bhadoria AS. Childhood obesity: causes and consequences. *J Family Med Prim Care* 2015;4(2):187-92.
- Griffiths LJ, Parsons TJ, Hill AJ. Self-esteem and quality of life in obese children and adolescents: a systematic review. *Int J Pediatr Obes* 2010;5(4):282-304.
- Walker L, Hill AJ. Obesity: the role of child mental health services. *Child Adolesc Ment Health* 2009;14(3):114-20.
- Wang F, Wild TC, Kipp W, Kuhle S, Veugelers PJ. The influence of childhood obesity on the development of self-esteem. *Health Rep* 2009;20(2):21-7.
- Wang F, Veugelers P. Self-esteem and cognitive development in the era of the childhood obesity epidemic. *Obes Rev* 2008;9(6):615-23.
- Morrison KM, Shin S, Tarnopolsky M, Taylor VH. Association of depression and health related quality of life with body composition in children and youth with obesity. *J Affect Disord* 2015;172:18-23.
- Strauss RS. Childhood obesity and self-esteem. *Pediatrics* 2000;105(1):e15.
- Mundy LK, Canterford L, Tucker D, Bayer J, Romaniuk H, Sawyer S, et al. Academic performance in primary school children with common emotional and behavioral problems. *J Sch Health* 2017;87(8):593-601.
- Shin NY, Shin MS. Body dissatisfaction, self-esteem, and depression in obese Korean children. *J Pediatr* 2008;152(4):502-6.
- Abós Á, Sevil J, Julián JA, Abarca-Sos A, García-González L. Improving students' predisposition towards physical education by optimizing their motivational processes in an acrosport unit. *Eur Phys Educ Rev* 2016;1356336X16654390.
- Collings PJ, Westgate K, Vaisto J, Wijndaele K, Atkin AJ, Haapala EA, et al. Cross-sectional associations of objectively-measured physical activity and sedentary time with body composition and cardiorespiratory fitness in mid-childhood: the PANIC Study. *Sports Med* 2017;47(4):769-80.
- Delgado Floody P, Martínez Salazar C, Caamaño Navarrete F, Jerez Mayorga D, Osorio Poblete A, García Pinillos F, et al. Insatisfacción con la imagen corporal y su relación con el estado nutricional, riesgo cardiometabólico y capacidad cardiorrespiratoria en niños pertenecientes a centros educativos públicos. *Nutr Hosp* 2017;34(5).
- Bevans KB, Fitzpatrick LA, Sánchez BM, Riley AW, Forrest C. Physical education resources, class management, and student physical activity levels: a structure-process-outcome approach to evaluating physical education effectiveness. *J Sch Health* 2010;80(12):573-80.
- Olaya-Contreras P, Ocampo D-C, Ladekjær Larsen E. Perceptions and practices of physical activity among Colombian overweight/obese schoolchildren. *Glob Qual Nurs Res* 2016;3:2333393616681392.
- Schröder H, Ribas L, Koebnick C, Funtikova A, Gómez SF, Fito M, et al. Prevalence of abdominal obesity in Spanish children and adolescents. Do we need waist circumference measurements in pediatric practice? *PLoS One* 2014;9(1):e87549.
- Chung IH, Park S, Park MJ, Yoo E-G. Waist-to-height ratio as an index for cardiometabolic risk in adolescents: results from the 1998-2008 KNHANES. *Yonsei Med J* 2016;57(3):658-63.
- Marchant T, Haeussler I, Torretti A. TAE: batería de tests de autoestima escolar. Santiago: Ediciones Universidad Católica de Chile; 2002.
- Danielsen YS, Stormark KM, Nordhus IH, Maehle M, Sand L, Ekornas B, et al. Factors associated with low self-esteem in children with overweight. *Obes Facts* 2012;5(5):722-33.
- Barr-Anderson DJ, Neumark-Sztainer D, Schmitz KH, Ward DS, Conway TL, Pratt C, et al. But I like PE: factors associated with enjoyment of physical education class in middle school girls. *Res Q Exerc Sport* 2008;79(1):18-27.
- Ribeiro IC, Parra DC, Hoehner CM, Soares J, Torres A, Pratt M, et al. School-based physical education programs: evidence-based physical activity interventions for youth in Latin America. *Glob Health Promot* 2010;17(2):5-15.
- Story M, Nanney MS, Schwartz MB. Schools and obesity prevention: creating school environments and policies to promote healthy eating and physical activity. *Milbank Q* 2009;87(1):71-100.
- Wu X, Kirk SF, Ohinmaa A, Veugelers P. Health behaviours, body weight and self-esteem among grade five students in Canada. *SpringerPlus* 2016;5(1):1099.
- Franklin J, Denyer G, Steinbeck KS, Caterson ID, Hill AJ. Obesity and risk of low self-esteem: a statewide survey of Australian children. *Pediatrics* 2006;118(6):2481-7.
- Salvo GL, Melipillán AR. Predictores de suicidalidad en adolescentes. *Rev Chil Neuro-Psiquiatr* 2008;46:115-23.
- Quek YH, Tam WW, Zhang MW, Ho R. Exploring the association between childhood and adolescent obesity and depression: a meta-analysis. *Obes Rev* 2017;18(7):742-54.
- Yusufov M, Dalrymple K, Bernstein MH, Walsh E, Rosenstein L, Chelminski I, et al. Body mass index, depression, and suicidality: the role of self-esteem in bariatric surgery candidates. *J Affect Disord* 2017;208:238-47.
- Moksnes UK, Espnes GA. Self-esteem and life satisfaction in adolescents - Gender and age as potential moderators. *Qual Life Res* 2013;22(10):2921-8.
- Moksnes UK, Espnes GA. Self-esteem and emotional health in adolescents - Gender and age as potential moderators. *Scand J Psychol* 2012;53(6):483-9.
- Menon M, Moyes HC, Bradley CM. Interactive influences of narcissism and self-esteem on insecure attachment in early adolescence. *J Early Adolesc* 2017;0272431617704955.