

ORIGINAL ARTICLE

Self-esteem and physical self-concept in adolescents on an emergency psychiatric unit**J. Simons,¹ P. Adriaenssens,² H. Delbroek³, M. Probst⁴**

¹ University Psychiatric Centre, KU Leuven, Campus Leuven, Gasthuisberg, Child & Adolescent Psychiatry, Belgium and Department of Rehabilitation Sciences, Heverlee, Belgium

² Emergency Child Psychiatry KU Leuven Child and Adolescent Psychiatry at the University Psychiatric Centre, KU Leuven, Belgium

³ Child Psychiatry KU Leuven Child and Adolescent Psychiatry at the University Psychiatric Centre, KU Leuven, Child & Adolescent Psychiatry, Herestraat, Belgium

⁴ Faculty of Kinesiology and Rehabilitation Sciences, Department of Rehabilitation Sciences, Belgium

Introduction

Self-esteem is one of the most well researched concepts in the psychological health. One of the major problems in the area of self-esteem research is the lack of a clear definition. Sometimes, a distinction is made between self-concept which is what one thinks about one's self, and self-esteem which is the positive or negative evaluation of one's self (how one feels about himself). Marsh, Parade and Ayotte (2004), however, state that researchers have commonly used the terms self-concept and self-esteem interchangeable in mental health research. Self-esteem may be defined as the totality of perceptions that each person has of himself. Given the fact that this term is frequently used, it is rather surprising that self-esteem in children and adolescents is not more frequently quantified.

Hence, measurement instruments were based on different definitions and theories (Sypsa, & Simons, 2008). The most extensively validated model, until now, is the multidimensional-hierarchical model, first developed by Shavelson, Hubner and Stanton (1976) and further extended by other researchers (e.g. Marsh, Richards,

Abstract

Self-esteem is a widely examined concept in the area of psychiatric disorders, less attention was given to the physical self-concept, till now. The purpose of this study was to evaluate self-esteem and the physical self-concept in adolescents with psychiatric disorders. The scores the Physical Self-Description Questionnaire (PSDQ) of adolescents on an urgent psychiatric unit (N = 208) were compared with the results of a matched group of non-clinical adolescents (N = 208) by means of MANOVA's. The Physical Self-Description Questionnaire is a reliable instrument as well in the clinical as in the non-clinical group. Self-esteem and Physical self-concept were lower in the clinical than in the non-clinical group. Girls (N = 107) in general scored lower than boys (N = 101) in both groups. The physical self-concept and the underlying specific motor competences seem to be excellent aspects to distinguish between different diagnostic categories. But they also suggest that physical activity could be of importance for mental health.

Keywords: Self-esteem, Self-concept Physical self-concept, Psychiatric disorders, Adolescents sensitivity

¹ **Corresponding author:** Johan Simons, PhD., University Psychiatric Centre, KU Leuven, Campus Leuven, Gasthuisberg, Child & Adolescent Psychiatry, Herestraat 49, B 3000 Leuven, Belgium and Faculty Kinesiology and Rehabilitation Sciences, Department of Rehabilitation Sciences, Tervuursevest 101, B 3001 Heverlee, Belgium, johan.simons@faber.kuleuven.be.

Johnson, Roche & Termayne, 1994). Multidimensional recognition of the self gives the opportunity to examine physical self as a distinct entity. The physical self-concept in this model is also viewed as multidimensional (Fox, 1997; Marsh et al., 1994). The hierarchical structure of physical self-concept suggests a top-to-bottom hierarchy, where global self-concept is at the apex and actual behavior is at the bottom. An appropriate approach to evaluate self-esteem in a more precise way may therefore be the use of more than one measure for self-esteem.

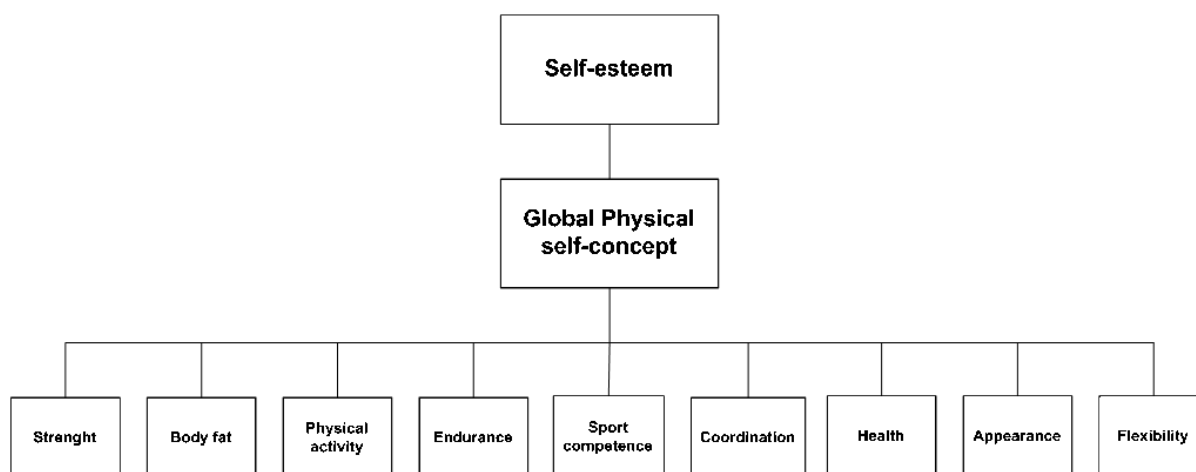


Figure 1. Hierarchical model of the self-esteem/body-esteem model.

A number of studies have examined the relationships between self-esteem and different psychiatric disorders first in adults (Robson, 1988; Silverstone & Salsali, 2003; Sukumaran, Vickers, Yates & Garralda, 2003) later on also in adolescents and children (Guillon, Crocq & Bailey, 2003; Simons, Capio, Adriaenssens, Delbroek & Vandenbussche, 2012). Research indicated that lowered self-esteem frequently accompanies psychiatric disorders such as in conduct disorders (Maïano, Ninot, Morin & Bilard, 2007), post-traumatic stress disorder (Stern, Lynch, Oates, O'Toole & Cooney, 1995; Saigh, Yasuib & Oberfield, 2008), anorexia nervosa (Jacobi, Paul, de Zwann, Nutzinger & Dahme, 2004; Erkolahiti, Saarijärvi, Ilonen & Hagman, 2002), depression and anxiety (Sukumaran et al., 2003), attention hyperactivity disorder (Sawyer, Whaites, Rey, Graetz & Baghurst, 2002; Edbom, Lichentein, Graunlund & Larsson, 2006; Escobar, Soutullo, Hervas, Gastaminza, Polavieja & Gilaberte, 2005; Dittman, Wehmeier, Schacht, Lehman & Lehmann, 2009). Till now, most of the studies used a one-dimensional approach of self-concept (e.g., Piers-Harris self-concept scale, Piers & Herzberg, 2002; Rosenberg self-esteem scale, 1965), or the self-esteem of a certain group is compared with the norm. In these studies, low self-esteem has been cited as a major contributory factor for both the onset and the persistence of the disorders. Sometimes these findings have not been consistent between studies, mostly due to the use of different definitions and/or instruments.

In a systematic review, Ekeland, Heian and Hagen (2005) indicated a positive effect of physical activity on self-concept in depression, anxiety and behavioral problems. But the association between actual and perceived motor competence

remains rather low in psychiatric adolescents (Simons, Sypsa & Vandebussche, 2008). Nevertheless the physical self-esteem seems to be an important component to influence self-esteem.

Two other problems seem to emerge in research on self-esteem. First there is this typical period in life, which is one of transition and the young person must re-define himself/herself in many areas. He or she experiences changes in his or her body (due to puberty), in his or her mental abilities, and in his or her social relationships. It is a period of gender-role intensification and important choices concerning school, leisure-time activities and so forth (Bolognini, Plancherel, Bettschart & Halfon, 1996). Secondly several studies have demonstrated differences in self-esteem and body-esteem between boys and girls (Demarest & Allen, 2000; Garner, 1997; Kearny-Cooke, 1999; Maïano, Ninot & Bilard, 2004; Muth & Cash, 1997; Smolak, 2004). Adolescent girls tend to evaluate their physical as well as their intellectual capacities in a more negative way and put more attention to their appearances (Kearny-Cooke, 1999; Muth & Cash, 1997). Smolak (2004) mentioned that girls have more difficulty with being overweight while boys would like to weigh more by having more muscles. On the other hand, girls think that boys like thin girls and boys think that girls like well-muscled boys (Demarest & Allen, 2000). A significant number of studies on adolescents have shown that boys have higher perceptions concerning their physical abilities than girls (Asci, 2002; Bowker, Gadbois & Cornock, 2003; Chan, Au, Chan, Kwan & Yiu, 2003; Crocker, Eklund & Kowalski, 2000; Faria, 2001; Raudsepp & Liblik, 2002; Rudisill, Mahar & Meany, 1993; Shapka & Keating, 2005). Nevertheless, girls' general self-concept does not differ from that of boys possibly due to perceptions in other areas of self-concept that compensate for the lower physical aspect (Bowker et al., 2003).

The present study aims to contribute to the understanding of self-concept and especially the physical self-concept among adolescents with psychiatric conditions. Building on the work of previous studies, this current research utilized a multi-dimensional approach at examining self-esteem and physical self-esteem including specific attributes of the physical self and comparisons are made between two participant groups (an urgent clinical and non-clinical group).

Based on what is known in literature the hypotheses for the present study are: (i) the clinical group will have a lower feelings about themselves than the matched non-clinical group, (ii) boys and girls will differ in overall self-esteem, in the general physical self-concept, and the different motor competences, (iii) there will differences on self-esteem and physical self-esteem depending on the psychiatric diagnosis.

Methods

Participants

A total of 416 adolescents participated in the present study. The psychiatric inpatient group was composed of 208 adolescents, including 107 females and 101 males with an average age of 14.56 years (SD=1.62 years). This study was approved by the local Ethics Committee and performed in accordance with the ethical standards laid down in the declaration of Helsinki. The parents of all participants gave written informed consent. All children gave their assent.

Procedure

All inpatients were assessed during the first week of their stay at the urgent psychiatric unit. To minimize the effect of readmission only the results of inpatient from their first stay at the hospital were included. Psychiatric diagnoses were gathered through a review of patient's medical records after their discharge from the hospital. Diagnoses were made at the time of the discharge by the attending psychiatrists on the basis of the DSM-IV criteria (American psychiatric association, 1992). The diagnoses most often given to the adolescent inpatients included mood disorders (17%), behavior disorders (14%), identity problems (10%), developmental disorders (9%), post-traumatic stress disorder (8%), attention deficit hyperactive disorder (7%), affective disorder (7%) and problems in interaction between parents and children (7%). 21% of the patients were excluded from the research due to an under-representative number in each of diagnostic categories.

To control the impact of hospitalization status on self-esteem and body-esteem, a school comparison group was used. The data of the clinical group were matched according to gender and age to the data of a non-clinical group who were randomly selected from a community sample of 1007 Flemish speaking non-clinical adolescents. The mean age of both groups was exactly the same and no significant difference in age was found between boys and girls.

Measures

The adolescents were asked to complete the *Physical Self-Description Questionnaire* (PSDQ, Marsh et al., 1994), a self-report questionnaire, which was translated for the purpose of this study using a back to back translation procedure (Brislin, 1970). The PSDQ is based on the hierarchical-multidimensional model of self-concept and assesses participants' physical self-concept through the measurement of 70 items divided over 11 scales as summarized in Table 1. These scales consist of the following: global self-esteem (8 items), global physical self-concept (6 items), strength (6 items), body fat (6 items), activity (6 items), endurance/fitness (6 items), sport competence (6 items), coordination (6 items), health (6 items), appearance (6 items) and flexibility (6 items). Response possibilities range on a 6-point scale, where 1 is not true and 6 is very true. The sum of scores (raw data) for each scale was used for the calculation of the different components. A number of studies support the reliability and validity of the PSDQ (Marsh et al., 1994; Marsh, Marco & Abcy, 2002; Richards & Marsh, 2006).

Table 1. Overview of the different aspects of the *Physical Self-Description Questionnaire*.

Factor	Description
Self-esteem	Global self-esteem
General physical self-concept	Global physical self-concept
Strength	Perceived physical strength
Body fat	Perceived body fat
Physical activity	Levels of physical activity in which one has engaged
Endurance	Perceived physical endurance/fitness
Sport competence	Perceptions of one's own sporting ability
Coordination	Perceived physical coordination
Health	Perceptions of one's own physical health
Appearance	Perceptions of own physical appearance
Flexibility	Perceived physical flexibility

Statistical analysis

To analyze the data, Statistica 10 (2011) was used. The internal consistency was checked on the data of the Flemish group by using Cronbach's *alpha*. Data were analyzed by multivariate analysis of variance (MANOVA) in which self-concept scores were dependent variables, while clinical versus non-clinical groups and gender were between-group independent variables. In the second analysis, the diagnostic groups were the independent variables. Differences in self and body concept for the different diagnostic groups and gender were examined by means of ANOVA, with Tukey HSD-test as post hoc tests.

Results

Internal consistency

The values for the Flemish non-clinical group varied from *alpha* .74 to .91, with a median of *alpha*=.85. The values for the Flemish clinical group varied from .79 to .94, with median of *alpha*=.89, indicating that the use of the scales is justified in a group of Flemish adolescents with psychiatric disorders (see Table 2).

Differences between results of the clinical and non-clinical group

A 2*2*11 MANOVA revealed a significant interaction effect Wilks' *lambda*=.884 ($F_{(11,400)} = 4.771, p=.000001, \eta^2=.12$). Significant simple effects were found for gender Wilks' *lambda*=.738 ($F_{(11,400)}=12.898, p<.0000001, \eta^2=.26$) and for clinical versus non-clinical group Wilks' *lambda*=.768 ($F_{(11,400)} = 11.006, p<.000001, \eta^2=.23$). All effects were large. Follow-up univariate analysis indicated significant gender differences in self-esteem and general physical self-concept, and in the other domains with exception for flexibility (see Table 2). Follow-up univariate analysis indicated significant differences in the clinical versus the non-clinical group for all scales except for strength, endurance and sport competence, with the non-clinical group having significantly higher scores.

Table 2. Overview of the mean, standard deviations and alpha-values for the different scales of the PSDQ on the clinical and non-clinical group.

Scales PSDQ	Non-clinical group (N = 208)			Clinical group (N = 208)		
	Mean	SD	Alpha	Mean	SD	Alpha
Self-esteem	4.6	.8	.81	3.74	1.36	.89
General physical self-concept	4.49	1.12	.88	3.64	1.64	.95
Strength	3.9	1.06	.84	3.82	1.31	.86
Body fat	4.54	1.34	.89	4.08	1.5	.86
Physical activity	3.75	1.34	.85	3.29	1.55	.87
Endurance	3.44	1.24	.87	3.28	1.53	.91
Sport competence	3.91	1.2	.91	3.78	1.52	.94
Coordination	4.21	.86	.74	3.79	1.09	.79
Health	4.63	.93	.81	4.32	1.1	.81
Appearance	4.04	1.06	.87	3.32	1.44	.91
Flexibility	4.01	1.09	.84	3.64	1.35	.89

Differences between results of the diagnostic groups.

A 2*2*11 MANOVA revealed a significant interaction effect Wilks' $\lambda=.632$ ($F_{(77, 834)}=.863$, $p=.791$, $\eta^2=.08$). Significant simple effects were found for gender Wilks' $\lambda=.645$ ($F_{(11,138)}=6.895$, $p<.001$, $\eta^2=.34$) and not for diagnostic groups Wilks' $\lambda=.545$ ($F_{(77,834)}=1.157$, $p<.177$, $\eta^2=.09$). Only for gender the effect was large the other effects were all small. Univariate analyses revealed significant gender differences for almost all the scales with exception of Health and Flexibility. Boys scoring higher than girls on all the scales.

Table 3. ANOVA results for gender and both groups.

Scales PSDQ	Gender		Clinical versus non-clinical	
	F (1,410)	p	F (1,410)	p
Self-esteem	26.268	.000001	69.004	.000001
General physical self-concept	55.379	.000001	46.955	.000001
Strength	13.719	.0002	0.504	.478
Body fat	32.646	.000001	12.352	.0005
Physical activity	24.385	.000001	10.602	.005
Endurance	68.567	.000001	1.482	.224
Sport competence	43.289	.000001	.933	.335
Coordination	16.133	.00007	20.98	.000006
Health	23.585	.000002	9.394	.002
Appearance	25.372	.000001	35.43	.000001
Flexibility	1.551	.214	9.411	.002

Table 4. Results on the PSDQ for the different diagnostic groups.

	Affective disorder (n=15) A	Behavior disorder (n=29) b	PTSS (n=16) c	Development disorder (n=18) d	Mood disorders (n=36) e	Identity problems (n=21) f	Interaction problems (n=15) g	ADHD (n=15) h	F	p	
Self-esteem	4.13±1.43	4.35±1.34	3.78±1.38	4.33±1.13	3.18±1.43	3.07±1.27	3.62±1.87	4.15±1.17	1.935	.07	b,d>e,f
General physical self-concept	4.28±1.74	4.40±1.56	3.60±1.71	4.22±1.38	2.79±1.6	2.90±1.46	3.63±1.53	4.11±1.43	2.737	.01	b>e,f a>e, d>e h>e
Strength	4.21±1.52	4.37±1.06	4.28±1.29	4.49±1.36	3.32±1.38	3.07±1.57	3.89±1.24	4.33±1.09	3.365	.002	b,d>e,f h>f
Body fat	4.07±1.38	4.19±1.44	3.75±1.49	4.27±1.57	4.13±1.5	4.30±1.48	3.63±1.52	3.68±1.77	1.002	.432	
Physical activity	3.64±1.8	3.78±1.47	3.48±1.54	3.96±1.48	2.71±1.42	2.98±1.38	3.07±1.63	3.39±1.71	1.031	.412	
Endurance	3.48±1.57	3.96±1.55	3.58±1.68	3.75±1.5	2.80±1.48	3.04±1.36	2.84±1.58	3.70±1.53	1.038	.407	b>e
Sport competence	4.22±1.91	4.66±1.39	4.14±1.61	3.99±1.45	3.37±1.45	3.47±1.2	4.07±1.42	4.34±1.22	2.016	.06	b>e,f
Coordination	3.76±1.19	4.10±1.29	3.97±1.19	4.18±0.9	3.58±1.23	3.55±0.75	3.74±1.12	3.82±1.04	0.63	.73	
Health	4.53±1.04	4.67±1.28	4.74±1.15	4.63±0.95	3.93±1.16	3.83±0.95	4.27±0.9	4.65±1.09	1.911	.07	
Appearance	3.64±1.7	3.77±1.35	3.42±1.57	3.92±1.17	2.53±1.34	2.89±1.3	3.47±1.47	3.41±1.24	2.099	.05	b,d>e
Flexibility	3.54±1.59	4.19±1.38	3.82±1.34	4.11±1.2	3.11±1.19	3.44±1.2	3.68±1.41	3.56±1.27	1.626	.132	b>e

Adolescents diagnosed with mood disorder (N=36) and identity problems (N=21) have the lowest scores. Adolescents with behavior problems on the contrary judged themselves the highest for self-esteem, physical self-concept, strength, endurance, sport competence, appearance and flexibility (see Table 4).

Discussion

The PSDQ of Marsh et al. (1994) appears to be a reliable instrument, user-friendly and easy to administer for both clinical ($\alpha=.79$ to $.94$) and non-clinical groups ($\alpha=.74$ to $.91$). The use of a multidimensional questionnaire allows a more in depth view of an individual's self-esteem and yields data from which potential clinical implications could be drawn. The weakest score was found for Coordination, maybe due to the fact that a lot of adolescents didn't understand the formulations of some questions according to this concept.

Boys consistently scored higher than girls for self-esteem, general physical self-concept and all the subscales, except for flexibility ($p=ns$) in the clinical groups. This supports the first hypothesis of this study, and is consistent with previous findings by Marsh (1989), Josephs et al, (1992), Marsh et al. (1994), Kling, Hyde, Showers, & Buswell (1999) and Sukumaran et al. (2003). Despite such consistency in recent literature, the reason girls report lower self-perception levels is still uncertain. Factors such as cultural expectations and differential opportunities to demonstrate competence could influence physical self-perceptions, and these should be examined in future research. In the non-clinical group the results of the girls were higher than those of the boys for self-esteem, strength, physical activity and flexibility.

There were significant differences between the clinical and non-clinical groups in self-concept, general physical self-concept and most of the domains, whereby the non-clinical group scored higher on all the scales. These findings support the second hypothesis of this study, and may be relevant to professionals who are involved in the development of therapeutic programs. While previous studies have shown similar trends (Robson, 1988; Bolognini et al, 1996; Silverstone & Salsali, 2003; Jacobi et al., 2004; Maïano et al., 2007), these have mostly used one-dimensional questionnaires or have compared the results with the test norms. This is to our knowledge the first time that a multidimensional scale was used and that the participants urgent psychiatric patients, were matched according to age and gender with a non-clinical group.

Self-concept appears to be correlated to mental health. The lower self-concept and the lower general physical self-concept found in the clinical group suggest psychopathology that is severe enough to lead to clinical follow up. The lower physical self-concept and the different subdomains may suggest that self-worth during adolescence is an important aspect of self-esteem. The fact that specific domains were affected could have implications for therapy. Ekeland et al. (2005) found evidence that exercise can improve self-esteem in an inexpensive and harmless way. It has been suggested that children with gross motor problems could be less likely to participate in games and sports requiring skills like jumping, running, throwing ball such that they tend to be less physically fit and less active than typically developing children (Cairney, Hay, Faught, Wade & Corna, 2005;

Cairney, Hay, Mandigo, Wade & Faight, 2007; Hands & Larkin, 2006). As such, it is possible that they are at risk of developing low self-concept (Peens, Pienaar & Nienaber, 2008; Piek, Baynam & Barrett, 2006; Poulsen, Zivian & Cuskelly, 2006; Skinner & Piek, 2001). However, in this study, no differences were found between the clinical and non-clinical groups for sport competence, strength and endurance. In a large cross-sectional study of about 2500 British adolescents, lower levels of physical activity were associated with more mental health problems than higher levels of physical activity (Ussher, Owen, Cook & Whincup, 2007). Difference between their study and this one was the measure of objective levels of physical activity by pedometers against the subjective self-reported physical activity in our study. Further investigation is needed to determine the underlying reasons for such findings. Nevertheless it remains unclear whether the lower self-concept and the lower Physical self-concept are a possible course for a psychiatric problem or that the psychiatric problem has led to a lower self-concept and a lower physical self-concept.

Despite the small effects for diagnosis, probably due to the rather small numbers of patients in each subgroup, the findings indicate that within the whole psychiatric group, differences depending on diagnosis were found especially for physical self-concept in terms of strength, flexibility, appearance, sport competence and endurance. For Physical self-concept, depressed adolescents and those with identity problems scored them lower than the adolescents with behavioral problems and developmental disorders. This appears to be consistent with expectations that adolescents who are depressed or having identity problems feel unhappy most of the time and often have somatic complaints (de Wit, Fokkema, van Straten, Lamers, Cuijpers & Penninx, 2010). For strength, adolescents with developmental disorders judged themselves stronger than adolescents with depression and identity problems. This could possibly be induced by the fact that a lot of the adolescents with developmental disorders have problems with aggression regulation and overestimate themselves. Also for appearance the group with behavior problems and developmental disorders judged themselves higher than the group with mood disorders. The link between low self-esteem and depressive disorders and identity problems is well known and the present study confirms the close relationship between low physical self-concept and the presence of depression and identity problems. The results of the Dutch survey (Monshouwer et al. 2013) show some support for the importance of psychological and sociological aspects of physical activity for mental health. So there are opportunities for adolescents with hyperkinetic disorders to take part in appropriate activity settings where their level of activity can be seen as a strength and could be fruitful for their self-esteem. Helping adolescents with ASD to participate in a sport or activity they master, despite the clumsiness, could be critical in preventing loneliness and other core problems they encounter. This is essential, not just to prevent the negative consequences, but also to promote the positive effects of physical activity as an additional treatment for psychiatric disorders.

To our knowledge it is the first time that is demonstrated, by using a multidimensional questionnaire, that physical self-esteem and the different competencies of it are linked with the psychiatric diagnosis. However, all these

observations should be tempered by the fact that additional comorbid disorders were not taken into account in this research and that some of the subgroups were very small.

Conclusions

Limitations

As some of the clinical subgroups are relatively small, the standard deviations of the data were rather large. Thus, caution is taken in the interpretation of the findings due to the possible effect of extremes in the individual data. This study used a cross sectional design, therefore it could not be ascertained whether a psychiatric disorder induced deficits in Self-concepts and Physical self-concept, or if the observed deficits already existed prior to clinical contact. It could be interesting to make differences in the different diagnostic groups, like for example in the group with ADHD between concentration problems and hyperactivity, in the group of mood disorders between suicidal and non-suicidal tendencies... Finally, this study did not account for the possible impact of age of the adolescents on their self-esteem. Younger adolescents could possibly perceive themselves differently compared to older ones, and this remains to be examined.

Implications for clinical practice

Given today's knowledge about the positive effect of physical activity on both physical and mental health, it is imperative to identify adolescents at risk, or who have a psychiatric disorder, and initiate interventions to increase physical activity as part of their treatment. Breaking the association between psychiatric disorders and low physical activity is essential, and these findings indicate the period of adolescence as a crucial time window within which to do that. This study adds to a growing body of evidence suggesting that self-esteem and physical-concept can be quantified in a standardized way in adolescents with psychiatric disorder. The results indicate that it could be useful for clinical practice to distinguish the different domains of the self-concept. The apparent differences in the clinical group's perceptions according to the subscales imply that treatment planning may be designed to target the more impaired domains of the adolescents' self-concepts. Moreover, it would be easier to influence a specific domain of self-concept rather than the global self-concept as a trait. Measurement of outcomes would also be more informative if the different domains would be evaluated, within the context of assessment in therapy.

References

- Asci, F. H. (2002). An investigation of age and gender differences in physical self-concept among Turkish late adolescents. *Adolescence*. Retrieved from: http://www.findarticles.com/p/articles/mi_m2248/is_146_37/ai_89942837.
- Bolognini, M., Plancherel, B., Bettschart, W., & Halfon, O. (1996). Self-esteem and mental health in early adolescence: development and gender differences. *Journal of Adolescence*, 19, 233-245. doi: 10.1006/jado.1996.0022.
- Bowker, A., Gadbois, S., & Cornock, B. (2003). Sports participation and self-esteem: Variations as a function of gender and gender role orientation. *Sex Roles: A Journal of Research*, 49(12), 47-58.
- Brislin, R. W. (1970). Back-translation for Cross-Cultural Research. *Journal of Cross-Cultural Psychology*, 1, 185-216. doi: 10.1177/135910457000100301
- Cairney, J., Hay, J. A., Faught, B. E., Wade, T. J., Corna, L., & Flouris, A. (2005). Developmental coordination disorder, generalized self-efficacy toward physical activity, and participation in organized and free play activities. *Journal of Pediatrics*, 147, 515-520. doi: 10.1016/j.jpeds.2005.05.013
- Cairney, J., Hay, J. A., Mandigo, J., Wade, T. J., Faught, B. E., & Flouris, A. (2007). Developmental coordination disorder and reported enjoyment of physical education in children. *European Physical Education Review*, 13, 81-98. doi: 10.1177/1356336X07072678
- Chan, E. W., Au, E. Y., Chan, B. H., Kwan, M. K., Yiu, P. Y., & Yeung, E. W. (2003). Relations among physical activity, physical fitness, and self-perceived fitness in Hong Kong adolescents. *Perceptual and Motor Skills*, 96, 787-797. doi: 10.2466/pms.2003.96.3.787
- Crocker, P. R., Eklund, R. C., & Kowalski, K. C. (2000). Children's physical activity and physical self-perceptions. *Journal of Sports Sciences*, 18, 383-394. doi: 10.1080/02640410050074313
- Demarest, J., & Allen, R. (2000). Body image: Gender ethnic, and age differences. *Journal of Social Psychology*, 140, 465-472. doi: 10.1080/00224540009600485.
- de Wit, L.M., Fokkema, M., van Straten, A., Lamers, F., Cuijpers, P., & Penninx, B.W. (2010). Depressive and anxiety disorders and the association with obesity, physical, and social activities. *Depression and Anxiety*, 27(11): 10-1065. doi:10.1002/da.20738.
- Dittman, R. W., Wehmeier, P. M., Schacht, A., Lehman, M., & Lehmann, G. (2009). Self-esteem in adolescent patient with attention-deficit/hyperactivity disorder during open-label atomoxetine treatment: psychometric evaluation of the Rosenberg Self-esteem Scale and clinical finding. *Atten Def Hyper disorder*, 1, 187-200. doi: 10.1007/s12402-009-0011-5
- Edbom, T., Lichentein, P., Graunlund, M., & Larsson J.O. (2006). Long-term relationships between symptoms of attention deficit hyperactivity disorder and self-esteem in a prospective longitudinal study of twins. *Acta Paediatr*, 95(6): 650-657. doi: 10.1080/08035250500449866
- Ekeland, E., Heian, F., & Hagen, K. B. (2005). Can exercise improve self-esteem in children and Young people: A systematic review of randomized controlled trials. *British Journal Sports Medicine*, 39, 792-798. doi: 10.1136/bjism.2004.017707
- Erkolahti, R. K., Saarijärvi, S., Ilonen, T., & Hagman, H. (2002). Self-image of anorexic and bulimic female adolescents. *Nordic Journal of Psychiatry*, 56, (6), 447-450. doi: 10.1080/08039480260389370
- Escobar, R., Soutullo, C. A., Hervas, A., Gastaminza, X., Polavieja, P., & Gilaberte, I. (2005). Worse quality of life for children with newly diagnosed attention-deficit/hyperactivity disorder, compared with asthmatic and healthy children. *Pediatrics*, 116 (3): e364-e369. doi: 10.1542/peds.2005-0386

- Faria, L. (2001). Harter's self-perception profile for children adapted for use with young Portuguese students. *Perceptual and Motor Skills, 92*, 711-720. doi: 10.2466/pms.2001.92.3.711
- Fox, K. R. (1997). The physical self and process in self-esteem development. In K. R. Fox (Ed.), *The physical self from motivation to well-being*. Champaign, IL: Human Kinetics.
- Garner, D. M. (1997). The 1997 body image survey results. *Psychology Today, 30*, 30-44.
- Guillon, M. S., Crocq, M., & Bailey, P. E. (2003). The relationship between self-esteem and psychiatric disorders in adolescents. *European Psychiatry, 18*, 59-62. doi: 10.1016/S0924-9338(03)00002-6
- Hands, B., & Larkin, D. (2006). Physical fitness differences in children with and without motor learning difficulties. *European Journal of Special Needs Education, 21*, 447-456. doi: 10.1080/08856250600956410
- Jacobi, C., Paul, T., de Zwann, M., Nutzinger, D. O., Dahne, B. (2004). Specificity of self-concept disturbances in eating disorders, *International Journal of eating Disorders, 35*, 204-210. doi: 10.1002/eat.10240
- Josephs, R. A., Markus, H. R., & Tafarodi, R. W. (1992). Gender and self-esteem. *Journal of Personality and social psychology, 63*(3), 391-402. doi: 10.1037//0022-3514.63.3.391
- Kearny-Cooke, A. (1999). Gender differences and self-esteem. *Journal of Gender Specific Medicine, 2*, 46-52.
- Kling, K. C., Hyde, J. S., Showers, C. J., & Buswell, B. N. (1999). Gender differences in self-esteem: a meta-analysis. *Psychological bulletin, 125*(4), 470-500. doi: 10.1037//0033-2909.125.4.470
- Maïano, C., Ninot, G., & Bilard, J. (2004). Age and gender effects on global self-esteem and physical self-perceptions in adolescents. *European Physical Education Review, 10*, 53-69.
- Maïano, C., Ninot, G., Morin, A. J., & Bilard, J. (2007). Effects of sport participation on the basketball skills and physical self of adolescents with conduct disorders. *Adapted Physical Activity Quarterly, 24*, 178-196.
- Marsh, H. W. (1989). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. *Journal of Educational Psychology, 81*, 417-430. doi: 10.1037/0022-0663.81.3.417
- Marsh, H. W., Marco, I. T., & Abcy, F. H. (2002). Cross-cultural validity of the physical self-description questionnaire: Comparison of factor structures in Australia, Spain, and Turkey. *Research Quarterly of Exercise and Sport, 73*, 257-270. doi: 10.1080/02701367.2002.10609019
- Marsh, H. W., Parada, R. H., & Ayotte, V. (2004). A multidimensional perspective of relations between self-concept (Self-Description Questionnaire II) and adolescent Mental Health (Young Self-report). *Psychological Assessment, 16*, 27-41. doi: 10.1037/1040-3590.16.1.27
- Marsh, H. W., Richards, G. E., Johnson, S., Roche, L., & Tremayne, P. (1994). Physical Self-Description Questionnaire: Psychometric properties and a multitraitmultimethod analysis of relations to existing instruments. *Journal of Sport and Exercise Psychology, 16*, 270-305.
- Monshouwer, K., Ten have, M., Van Poppel, M., Kemper, H., & Vollebergh, W. (2013). Possible mechanisms explaining the association between physical activity and mental health: Findings from the 2001 Dutch health behaviour in school-aged children survey. *Clinical psychological Science, 1*(1), 67-74. doi: 10.1177/217702612450485
- Muth, J. L., & Cash, T. F. (1997). Body images attitudes: What difference does gender make? *Journal of Applied Social Psychology, 27*, 1438-1452. doi: 10.1111/j.1559-1816.1997.tb01607.x

- Peens, A., Pienaar, A. E., & Nienaber, A. W. (2008). The effect of different intervention programs on the self-concept and motor proficiency of 7- to 9 year-old children with DCD. *Child: Care, Health and Development*, 34, 316–328. doi: 10.1111/j.1365-2214.2007.00803.x
- Piek, J. P., Baynam, G. B., & Barrett, N. C. (2006). The relationship between fine and gross motor ability, self-perceptions and self-worth in children and adolescents. *Human Movement Science*, 25, 65–75. doi: 10.1016/j.humov.2005.10.011
- Piers, E. V., & Herzberg, D. S. (2002). *Piers-Harris self-concept scale; manual (2nd ed.)*. Los Angeles, CA: Western Psychological Services.
- Poulsen, A. A., Ziviani, J. M., & Cuskelly, M. (2006). General self-concept and life satisfactions for boys with differing levels of physical coordination: The role of goal orientations and leisure participation. *Human Movement Science*, 25, 839–860. doi: 10.1016/j.humov.2006.05.003
- Raudsepp, L., & Liblik, R. (2002). Relationship of perceived and actual motor competence in children. *Perceptual and Motor Skills*, 94, 1059–1070. doi: 10.2466/PMS.94.3.1059-1070
- Richards, G. E., & Marsh, H. W. (2006). *Physical self-concept as an important outcome in physical education classes: Evaluation of the usefulness in physical education of three physical self-concept measures utilizing a database of Australian and Israeli students*. Sydney, Australia: SELF Research Center Univer. of Western Sydney.
- Robson, P. J. (1988). Self-esteem- A psychiatric view. *British journal of Psychiatry*, 153, 6-15. doi: 10.1192/bjp.153.1.6
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton: Princeton University Press.
- Rudisill, M. E., Mahar, M. T., & Meaney, K. S. (1993). The relationship between children's perceived and actual motor competence. *Perceptual and Motor Skills*, 76, 895–906. doi: 10.2466/pms.1993.76.3.895
- Saigh, P. A., Yasuib, A. E., Oberfield, R., & Halamandaris, P. V. (2008). The self-concept of traumatized children and adolescents with or without PTSD. *Behaviour Research and Therapy*, 46, 1181–1186. doi: 10.1016/j.brat.2008.05.003
- Sawyer, M. G., Whaites, L., Rey, J. M., Hazell, P. L., Graetz, B. W., & Baghurst, P. , (2002). Health related quality of life of children and adolescents with mental disorders. *J. Am. Acad. Child adolescent psychiatry*, 41(5), 530-537. doi: 10.1097/00004583-200205000-00010
- Shapka, J. D., & Keating, D. P. (2005). Structure and change in self-concept during adolescence. *Canadian Journal of Behavioural Science*, 37, 73–96. doi: 10.1037/h0087247
- Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-concept: Validation of construct interpretations. *Review of Educational Research*, 46, 407–441. doi: 10.3102/00346543046003407
- Silverstone P. H., & Salsali, M. (2003). Low self-esteem and psychiatric patients: part 1- The relationship between low-self-esteem and psychiatric diagnosis. *Annals of general Hospital psychiatry*, 2:2 doi: 10.1186/1475-2832-2-2.
- Simons, J., Capio, C. M., Adriaenssens, P., Delbroek, H., & Vandenbussche, I. (2012). Self-concept and physical self-concept in psychiatric children and adolescents. *Research in Developmental disabilities*, 33, 874-881. doi: 10.1016/j.ridd.2011.12.012
- Simons, J., Sypsa, C., & Vandenbussche, I. (2008). Relationship between actual and perceived motor competence in a group of adolescents with psychiatric disorders. *European Psychomotricity Journal*, 1, 18–28.

- Skinner, R. A., & Piek, J. P. (2001). Psychosocial implications of poor motor coordination in children and adolescents. *Human Movement Science, 20*, 73-94. doi: 10.1016/S0167-9457(01)00029-X
- Smolak, L. (2004). Body image in children and adolescents: Where do we go from here? *Body Image, 1*, 15-28. doi: 10.1016/S1740-1445(03)00008-1
- Statistica 10 (2011). Tulsa, Oklahoma: StatSoft, Inc.
- Stern, A. E., Lynch, D. L., Oates, R. K., O'Toole, B. I., & Cooney, G. (1995). Self-esteem, depression, behaviour and family functioning in sexually abused children. *Journal of Child Psychology and Psychiatry, 36*(6), 1077-89.
- Sukumaran, S., Vickers, B., Yates, P., & Garralda, M. E. (2003). Self-esteem in child and adolescent psychiatric patients. *European Child & Adolescent Psychiatry, 12*(4), 190-197. doi: 10.1007/s00787-003-0312-8
- Sypsa, C., & Simons, J. (2008). Questionnaires measuring the physical self in children: A review. *European Psychomotricity Journal, 1*, 61-72.
- Ussher, M.H., Owen, C.G., Cook, D.G., & Whincup, P.H. (2007). The relationship between physical activity, sedentary behavior and psychological wellbeing among adolescents. *Social Psychiatry & Psychiatric Epidemiology, 42*(10), 851-856. doi: 10.1007/s00127-007-0232-x