

## ORIGINAL ARTICLE

## Sports participation, body appreciation and life satisfaction in Norwegian adolescents: A moderated mediation analysis

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### Abstract

**Aims:** Life satisfaction is an important aspect of quality of life and plays an essential role in optimal developmental adaption in adolescence. This study investigated whether being active in organised leisure sports is associated with a higher level of life satisfaction among adolescents, both directly and indirectly, through increased body appreciation. Whether gender moderates the mentioned associations will also be examined. **Methods:** The study was cross-sectional and based on a sample of 541 participants (44% females) between 16 and 19 years of age ( $M_{\text{age}}=16.89$  years,  $SD=0.46$ ). A moderated mediation model was examined using SPSS v27 and the PROCESS macro. **Results:** Boys had higher life satisfaction and body appreciation levels than girls did. There was no direct effect of organised leisure sports participation on life satisfaction. However, there was a positive association between organised leisure sports participation and life satisfaction through increased body appreciation. No gender differences were observed for the direct association between sports participation and life satisfaction or the indirect associations between sports participation and life satisfaction through body appreciation. **Conclusions:** **Our findings support that body appreciation is a mediator for the association between organised leisure sports participation and life satisfaction for both boys and girls. Longitudinal studies should be conducted to further examine if causal relationships exist.**

**Keywords:** *Life satisfaction, body appreciation, organised leisure sports participation, positive youth development*

### Introduction

Life satisfaction, described as how individuals cognitively evaluate their life, is an important aspect of quality of life [1] and plays an essential role in optimal developmental adaption in adolescence [2]. According to the findings of an international study across Nordic countries, the percentage of Norwegian adolescents experiencing high life satisfaction increased from 32% to 42% over a 12-year period [3]. However, the overall tendency showed that high life satisfaction declines as adolescents grow older [3]. Therefore, identifying factors that could improve older adolescents' life satisfaction is important. The adolescent years are characterised by physical,

psychosocial and cognitive growth that mark the transition from childhood to adulthood [4], for example rapid physical changes in the body due to pubertal maturation could affect the development of body image [5]. In that regard, the development of a positive body image could be considered particularly valuable.

Body image is a multidimensional construct concerning 'the subjective picture of our own body which we form in our mind' [6]. The theoretical and empirical field of body image research has traditionally focused on negative aspects of body image, such as body dissatisfaction, and therefore, there is a need for more knowledge about predictors and outcomes of a positive body image [7]. One central aspect of a

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positive body image is body appreciation, defined as accepting, holding favourable opinions towards and respecting the body, as well as rejecting unrealistic appearance ideals [7]. If body characteristics, including functionality, health, appearance and wellness aspects, are positively evaluated, this can enhance the experience of body appreciation [8]. Up-to-date research suggests there is a positive association between body appreciation and positive health outcomes such as life satisfaction [9–11] and mental well-being [12,13]. Even though research has indicated that the development of a positive body image during adolescence is crucial for mental well-being in both boys and girls [12,13], the existing research mainly focuses on young women [14].

The World Health Organization (WHO) has identified settings for physical activity as core areas to promote mental health, quality of life and well-being [15]. According to the positive youth development theory, the development and growth of adolescents are continuously shaped through mutual interactions between individuals and contexts [16], with organised sports being one such context that could provide positive developmental experiences in the personal, social or physical domain of life [17]. Indeed, it has been suggested that participation in organised sports and physical activity could contribute to adolescents' developmental experiences through the body's physical function, such as coordination and other fundamental movement skills [17]. Menzel and Levine's model of the development of positive body image suggests that embodying activities such as competitive sports could either directly or indirectly lead to a positive body image through less self-objectification [18]. Self-objectification is a psychological process where the individual has adopted a third-person perspective on the body, focusing on an exterior aspect, such as appearance, body shape or weight, rather than how one's body is subjectively experienced [19]. According to the objectification theory, body monitoring and self-objectification are identified as risk factors for lower quality of life, particularly among females [19].

Given the body's centrality in engaging in healthy behaviours such as sports, organised leisure sports could thus be a focus area to promote a positive body image and, in turn, life satisfaction. Previous cross-sectional studies have demonstrated positive associations between organised leisure sports participation and a positive body image or body appreciation in adolescents and young adults [11,20–22]. In a qualitative study from Sweden, the majority of 10- to 13-year-old adolescents with a positive body image characterised themselves as active in organised leisure sports, and they considered being physically

active as joyful and health promoting [23]. Greenleaf et al. [24] showed that a positive association between female high school sports participation and life satisfaction indirectly occurred through body satisfaction, physical competence and instrumentality. Thus, it is of great importance to explore further if body appreciation could be an explanatory mechanism in the relationship between sports participation and life satisfaction in adolescence.

### *Aims and hypotheses*

This study explored the relationships between sports participation, body appreciation and life satisfaction, and whether there are any gender differences in these associations. Based on previous research and theoretical assumptions, we hypothesised:

H1: Increased participation in organised leisure sports is directly associated with higher levels of life satisfaction.

H2: Increased participation in organised leisure sports is indirectly associated with life satisfaction through increased body appreciation.

Due to a lack of previous body appreciation research in adolescents, a specific hypothesis was not formulated regarding the moderation of gender effects.

## **Methods**

### *Design, data collection procedure and participants*

The present study was a cross-sectional study using data from the control arm of the COMPLETE study, a randomised controlled trial conducted in two Norwegian counties [25]. The data were collected through an electronic questionnaire in 2017 at the first follow-up of the study [25]. Of 735 students from five upper secondary schools, 557 (75.8%) responded. Of these, 541 were between 16 and 19 years of age ( $M_{\text{age}}=16.89$  years,  $SD=0.46$ ), complying with the WHO's [4] definition of 'adolescent' (10–19 years of age), and accordingly were included in the current study. The adolescents filled out the questionnaire during a school class under the administration of researchers and research assistants in the project [25].

### *Measures*

Life satisfaction was measured using Huebner's Students' Life Satisfaction Scale (SLSS) [1]. The SLSS measures people's inner thoughts and evaluation of

their satisfaction with life as a global phenomenon. The SLSS consists of nine items, each presenting a statement such as ‘I have a good life’ or ‘I have what I want in life’, which the participants rated on a scale with response options 1=never, 2=sometimes, 3=often and 4=almost always [1]. A Norwegian version of the SLSS has previously been validated among adolescents [26]. After the recoding of the two negatively worded items, we examined the internal reliability of the scale. In this current study, McDonald’s omega coefficient was 0.90.

Body appreciation was measured using the Body Appreciation Scale 2 (BAS-2) [27]. The BAS-2 consists of 10 items, all reflecting aspects of having a positive body image, such as ‘I respect my body’ or ‘I feel good about my body’. Response options were 1=never, 2=seldom, 3=sometimes, 4=often and 5=always [27]. In the study by Urke et al. [12], which was also based on data from the COMPLETE study, the BAS-2 achieved strict measurement invariance across gender. Following the validation of the Norwegian version of the BAS-2 in an adolescent sample, estimation of some residual covariances was required to achieve an acceptable model fit. Internal consistency was reported with a McDonald’s omega coefficient of 0.98 [12]. In the current study, the BAS-2 showed a unidimensional structure, and McDonald’s omega coefficient was 0.97.

Participation in organised leisure sports activities was measured using one question: ‘How often do you usually participate in these types of organised activities in your spare time?’ Organised activities were described as activities that are driven by sports clubs, other clubs or organisations. In the questionnaire, one item assessed team sports (e.g. football, handball, basketball and ice hockey), and another item assessed individual sports (e.g. swimming, cycling, martial arts, athletics, gymnastics, dance and cross-country skiing). Response options were 1=does not engage in this type of activity, 2=two or three times a month, 3=about once a week and 4=two times a week or more often. For both types of sports participation variables (team sports and individual sports), the responses were dichotomised into ‘two or three times a month or never’ coded as 0 (not active), and ‘about once a week or more often’ coded as 1 (active). The two sports participation variables were then merged into one new variable called ‘organised leisure sports participation’, with those scoring 0 coded as 0 (not active) and those scoring 0.5 or 1 coded as 1 (active in either team sports or individual sports, or in both).

Gender was based on registry data and was coded as 0 (boys) and 1 (girls). Perceived family wealth, one indicator of socio-economic position (SEP), was

measured using one question: ‘How well off is your family?’ [28]. SEP was assessed on a scale with response options 1=not at all well off, 2=not well off, 3=moderately well off, 4=well off and 5=very well off. Based on descriptive analysis, we created a dummy variable where the answers were dichotomised with the median value as the cut-off point, with responses ranging from 1 to 3 categorised as ‘low SEP’ (coded as 0) and responses 4 or 5 categorised as ‘high SEP’ (coded as 1). To exclude the influence of SEP on life satisfaction [28], SEP was included as a control variable in the statistical analysis.

### *Statistical analyses*

Statistical analyses were conducted using IBM SPSS Statistics for Windows v27 (IBM Corp., Armonk, NY) and the PROCESS macro. Of the 541 respondents, 466 (86.1%) had a full response to all study variables. All study variables had missing values <10% (ranging between  $n=7$  and  $n=51$ ). A Little’s missing completely at random (MCAR) test was not significant ( $\chi^2=0.028$ ,  $df=2$ ,  $p=0.986$ ), indicating no systematic missing patterns in the study constructs. The only available option to handle missing values in PROCESS was through listwise deletion [29]. According to Newman [30], we were able to use listwise deletion of missing values without it being biased because the values were missing completely at random.

Further, the contemporary understanding of mediation testing in PROCESS, with 5000 bootstrap confidence intervals (CI), is a robust method, considering the normality of the data [29]. According to Hayes, the only requirement of a mediation analysis, applying model 4, is that the independent variable (sports participation) is significantly associated with the mediator variable (body appreciation) and the mediator variable is significantly associated with the outcome variable (life satisfaction) [29].

As Figure 1 shows, participation in organised leisure sports is assumed to affect life satisfaction, either directly or indirectly, through body appreciation. Due to previous research indicating gender differences in the levels of organised leisure sports participation [31], body appreciation [32] and life satisfaction [3,26,31], we also examined whether the mentioned relationships were moderated by gender, applying Hayes model 59, a moderated mediation analysis, in PROCESS.

### *Ethics*

The COMPLETE study was approved by the Norwegian Centre for Research Data [25]. This is an approval stating that the planned processing of

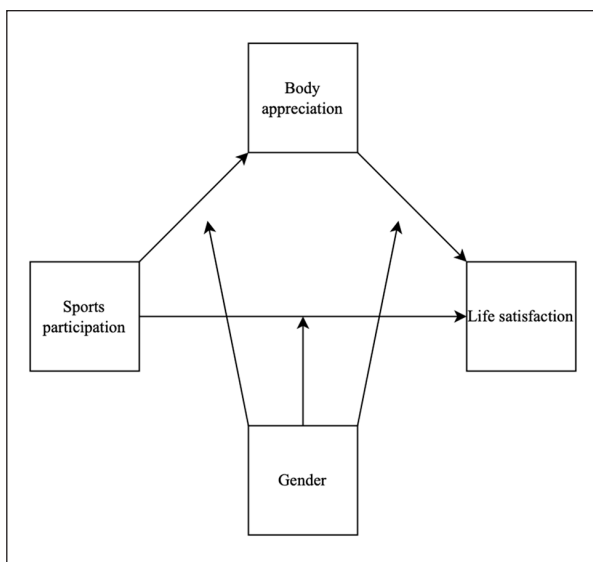


Figure 1. Conceptual moderated mediation model, adapted by Hayes [29].

personal data is following the Norwegian Personal Data Act. All respondents were aged  $\geq 16$  years when the survey was conducted. Thus, no parental or guardian consent was needed for participation. Written and oral information about the study's aims and participation was given to all respondents [25].

## Results

Table I shows that boys had higher levels of body appreciation and life satisfaction than girls. No gender differences were observed in organised leisure sports participation, where about half of both boys and girls participated.

Correlation coefficients between study variables indicated a strong relationship only between body appreciation and life satisfaction (Table II).

There was no significant direct association between organised leisure sports participation and life satisfaction, controlling for gender, SEP and body appreciation (Table III). However, when body appreciation was accounted for in the mediation model, the magnitude of the direct path was reduced, indicating an indirect association. A bootstrap CI for the indirect association did not include zero, meaning that the positive association between organised leisure sports participation and life satisfaction was preceded by body appreciation. Table III shows that organised leisure sports participation was a significant predictor of body appreciation and that body appreciation was a significant predictor of life satisfaction. The moderation of the indirect path by gender was not significant (the index of moderated mediation=0.064, 95% CI

-0.195 to 0.066), nor was the direct path (Table IV), showing no gender differences.

## Discussion

The results of the present study showed greater body appreciation in adolescents who regularly participated in sports compared to those who did not, which in turn led to greater life satisfaction. We hypothesised a direct association between organised leisure sports participation and life satisfaction (H1) that was not found. In line with H2, our results provide evidence that body appreciation was an explanatory mechanism in the relationship between sports participation and life satisfaction. No gender differences were observed.

Seen from a positive youth development perspective, participation in organised leisure sports may provide opportunities for healthy development, such as greater life satisfaction [31,33]. Evidence that this association is mediated by body appreciation is considered novel and relevant to the health promotion field. Our finding that adolescents participating in organised leisure sports reported greater body appreciation than non-active peers is supported by Jankauskiene et al. [20]. Correspondingly, greater body appreciation was found in exercise students compared to students in other university subjects [11] and student athletes compared to non-athletes [34]. Research suggests that the physical activity level and the functional qualities of the body could be important in strengthening a positive body image [11,14,23,24,34]. Indeed, differences in a positive body image between the abovementioned groups might be explained by elevated levels of physical fitness [20], or physical competence and instrumentality [24], among other physical qualities provided by the developmental challenges of sports participation. Thus, the sports environment may be an excellent arena to promote a positive body image through functionality appreciation, which in turn may lead to greater life satisfaction.

The results could, to some extent, be explained by Menzel and Levine's [18] model of positive body image development. This model suggests that participation in embodying activities, such as competitive sports, is key to promoting a positive body image. Sports participation could lead to a positive body image through less self-objectification, that is, a more internally orientated experience of one's body over exterior monitoring [18]. Thus, if the sports environment provides individuals with the resources they need to reject the societal body ideal, this could protect against exterior monitoring, and if it nourishes the body, its wellness, health and the functions it performs,

Table I. Descriptive statistics and independent samples *t*-test/chi-square test for independence to assess gender differences in the study variables.

	Boys		Girls		Total (N=541)	Min, max	Skewness (SE)	Kurtosis (SE)	<i>t</i> (df)	Eta (%)	Phi $\chi^2$
	<i>n</i>	<i>M</i> (SD)/%	<i>n</i>	<i>M</i> (SD)/%	<i>M</i> (SD)/%						
Age	304	16.91 (0.48)	237	16.86 (0.42)	16.89 (0.46)	16–19	2.32 (0.11)	9.40 (0.21)	1.10 (539)	–	–
Sports participation	299		235		–	–	–	–	–	–	0.00
Not active	143	47.8%	111	47.2%	47.6%	–	–	–	–	–	–
Active	156	52.2%	124	52.8%	52.4%	–	–	–	–	–	–
Body appreciation	265	3.90 (0.93)	225	3.35 (1.04)	3.65 (1.02)	1–5	–0.53 (0.11)	–0.41 (0.22)	6.08* (453)	7.02	–
Life satisfaction	281	2.95 (0.66)	225	2.70 (0.72)	2.84 (0.70)	1–4	–0.34 (0.11)	–0.62 (0.22)	4.08* (504)	3.20	–

\*\**p*<.001, N: number of observations; M: mean; SD: standard deviation; SE: standard error; T: *t*-value; df: degrees of freedom.

Table II. Intercorrelations for the study variables.

	1	2	3	4
1. Life satisfaction	–			
2. Body appreciation	0.58**	–		
3. Gender	–0.18**	–0.27**	–	
4. Sports participation	0.09*	0.12**	0.01	–

Sports participation is coded as inactive (0) and active (1). Gender is coded as boys (0) and girls (1). \*\**p*<0.01; \**p*<0.05.

Table III. Mediation analysis.

Effects	B	B SE	$\beta$	<i>t</i>	<i>p</i>	Bootstrap 95% CI	
						Lower	Upper
Total path	0.107	0.060	–	1.785	0.075	–0.011	0.225
Direct path	0.026	0.051	–	0.512	0.609	–0.075	0.127
Indirect path	0.081	0.033	0.120	–	–	0.017	0.147
Sports→BA	0.229	0.090	0.224	2.550	0.011	0.052	0.405
BA→Lifsat	0.354	0.027	0.533	13.351	0.000	0.302	0.406

The model is adjusted for gender and SEP. Bootstrap N=5000.

B: unstandardised coefficients;  $\beta$ : standardised coefficients; CI: confidence interval; Sports: sports participation; BA: body appreciation; Lifsat: life satisfaction.

Table IV. Moderated mediation model by gender.

Values of the moderator	B	SE	Bootstrap 95% CI	
			Lower	Upper
Indirect path: Sports participation→Body appreciation→Life satisfaction				
0 Boy	0.109	0.043	0.031	0.201
1 Girl	0.044	0.053	–0.058	0.147
Direct path: Sports participation→Life satisfaction				
0 Boy	0.004	0.070	–0.134	0.142
1 Girl	0.057	0.076	–0.092	0.206

Gender is coded as boys (0) and girls (1). The model is adjusted for SEP. Bootstrap N=5000.

this may lead to greater body appreciation. On the other hand, a more positive body image among athletes compared to non-athletes could also be due to how practicing sports and exercise may lead athletes closer

to the body ideal [22]. Even though sports participation could promote body appreciation in adolescence [20], exposure to body appearance pressure may also lead to unfavourable health consequences such as lower life satisfaction if individuals who are active in sports do not learn how to resist the strong athletic body idealisation [11]. On the other hand, a more positive body image among athletes compared to non-athletes could also be due to how practicing sports and exercise may lead athletes closer to the body ideal [22].

Our results are in accordance with previous research demonstrating that adolescent boys, overall and compared to girls, had higher levels of body appreciation [12,13,20,32] and life satisfaction [3,26]. A novel finding in our study was that the observed relationship between organised leisure sports participation and life satisfaction, which was indirectly accounted for by body appreciation, did not differ across gender. Only a limited number of studies have assessed the relationships between the study variables across adolescent boys and girls previously. Consistent with previous cross-sectional studies in young adults [10,11], we found no gender differences in the association between body appreciation and life satisfaction, indicating that body appreciation could improve both boys' and girls' life satisfaction in late adolescence. The results from a cross-sectional study [20] align with our study's findings and demonstrate that participation in leisure exercise was positively associated with body appreciation for both boys and girls. However, the results from another cross-sectional study showed that among students enrolled in exercise science programmes in Norwegian universities, only females reported higher levels of body appreciation compared to peers enrolled in other university subjects [11]. In that study, the mean age of the participants was 24 years. Thus, there may be age-related differences in body appreciation.

Nevertheless, it is conceivable that there can be differences between gender in the sense that adolescent boys and girls emphasise different aspects (function, appearance, health or well-being) of

importance for their body appreciation. The BAS-2 is, however, a holistic measure, and thus it may not capture the differences in these specific aspects of body appreciation.

### Limitations

One limitation of this study is the cross-sectional nature of the data. We cannot be certain if the conceptual framework best reflects reality, considering the possibility that the associations could be bidirectional. For example, a previous longitudinal study in an adolescent female sample showed that body appreciation predicted an increase in sports and physical activity participation one year later [21]. Longitudinal research is needed to establish the direction of effects more firmly.

Our participants were sampled from five upper secondary schools, and this reduces the external validity. On the other hand, the sample had a relatively even gender distribution (44% females), and the schools were recruited from both urban and rural areas in northern and western Norway, which strengthened the generalisability of the results. However, because the data were not based on nationally representative sampling, the results should be interpreted with caution.

Another limitation might be the use of self-reported data in questionnaires, which could lead to response biases. In this study, validated scales were used to assess body appreciation [13] and life satisfaction [1] to minimise the risk of systematic biases, and statistical tests demonstrated good internal consistency reliability. The organised leisure sports participation item has demonstrated acceptable levels of agreement, indicating good reliability [35], and a similar one-question measure of sports participation has been applied in previous research on adolescents using data from the Health Behavior in School-Aged Children survey [31,33].

### Conclusions

Our findings showed that the positive association between sports participation and life satisfaction was dependent on body appreciation as an explanatory mechanism for both boys and girls. Thus, one way to increase life satisfaction indirectly through body appreciation could be to encourage adolescents to engage in and remain longer in organised leisure sports. Hence, supporting organised leisure sports clubs and facilitating team and individual activities that nourishes the well-being of the body during sports participation would be an important public health initiative to strengthen adolescents' life satisfaction.

Future research should explore moderators and mediators in the relationships between organised leisure sports participation, body appreciation and life satisfaction to get a better understanding of how this could be done. Such research may benefit future implementation strategies aiming to improve central components of positive physical and psychological development in adolescence.

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