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**HAS GENERAL POPULATION ADOLESCENTS' BODY
IMAGE CHANGED ALONGSIDE THE INCREASE IN THE
NEED FOR GENDER IDENTITY SERVICES?**

Lääketieteen ja terveysteknologian tiedekunta
Syventävä opinnäytetyö
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TIIVISTELMÄ

Saara Huusko: Onko nuoruusikäisen väestön ruumiinkuva muuttunut nuorten sukupuoli-identiteetin palveluiden kysynnän kasvaessa?

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Tampereen yliopisto

Lääketieteen kandidaatti

Nuoret ovat kärsineet ruumiinkuvan ongelmista muita ikäryhmiä enemmän ja ovat siten alttiimpia ruumiinkuvan häiriöille. Aikaisempi tutkimus on keskittynyt yksinomaan painoon ja kokoon liittyvien huolenaiheiden sekä ruumiinkuvan ja mielenterveyden väliseen suhteeseen. Tämän tutkimuksen tavoitteena oli tutkia nuorten kehonkuvaa, sen viimeaikaista muutosta sukupuoli-identiteetin näkökulmasta ja verrata sitä sukupuolenvaihtoa hakeviin murrosikäisiin, joiden määrä on viime aikoina kasvanut.

Tutkimuksessa käytetty aineisto kerättiin Body Image Scale-kyselyllä (BIS). BIS-kysely on kehonkuvan arviointiin käytetty mittari, jossa ruumiinosia arvioidaan asteikolla erittäin tyytyväisestä (1) neutraaliin (3) ja erittäin tyytymättömään (5). Korkeat pisteet kyselystä indikoivat huonompaa ruumiinkuvaa. Kyselyyn vastasivat kolmen Tampereen alueen lukion opiskelijat lukuvuosina 2012–2013 ja 2017. Tutkimukseen osallistui hyväksyttävästi 1102 tyttöä ja 644 poikaa. Kliininen otanta koostui vuosina 2011–2015 Tampereen yliopistollisen sairaalan nuorten psykiatriselle osastolle sukupuoli-identiteetin tutkimukseen sukupuolen korjaushoitotoivein hakeutuneesta nuoresta, jotka vastasivat BIS-kyselyyn. Tutkimuksessa käytettiin 14 miehenä syntyneen ja 71 naisena syntyneen nuoren vastaustietoja.

Tytöt olivat poikia tyytymättömämpiä kehon kaikkiin osa-alueisiin. Silti BIS-pistearvot jäivät kokonaisuudessaan alle kolmen (3), mikä indikoi neutraalia parempaa kehonkuvaa. BIS:n kokonaispisteet vuosien 2012 ja 2017 välillä eivät eronneet tilastollisesti merkittävästi kummankaan sukupuolen osalta. Nuoret, jotka etsivät sukupuolenvaihtoa, saivat väestöä korkeammat BIS-arvot (> 3). Tulosten perusteella voidaan todeta, että erityisesti nais- ja transsukupuoliset nuoret kärsivät edelleen ruumiinkuvaan liittyvästä tyytymättömyydestä. Nuorten ruumiinkuva kokonaisuudessaan on siitä huolimatta suhteellisen hyvä, eikä nuorten kehottymättömyydessä ole tapahtunut muutosta, vaikka odotimme kehitystä huonompaan suuntaan. Mielenkiintoista on se, että sukupuoli-identiteetin tutkimukseen hakeutuneiden nuorten kehottymättömyys ei rajautunut vain sukupuolta ilmentäviin ruumiinosiin, vaan he olivat myös väestöä tyytymättömämpiä neutraaleihin ruumiinosiin. Tämä viittaa siihen, että sukupuolidysforiasta kärsivät nuoret ovat alttiimpia huonompaan ruumiinkuvaan.

Tutkimus nuorten ruumiinkuvasta ja siihen vaikuttavista tekijöistä on vielä puutteellista. Tulevaisuuden tutkimuksen tulisi keskittyä enemmän selvittämään nuorten kehon tyytymättömyyden laatua ja syitä sen taustalla. Sukupuoli-identiteetin sekä sukupuoliroolien vaikutusta nuorten kehonkuvaan ei vielä tunneta myöskään tarpeeksi. Lisäksi nuorten ruumiinkuvan tilanteesta ja laadusta saatuja perustietoja voidaan käyttää nuorten sukupuoli-identiteettiklinikoilla arvioitaessa sukupuolenkorjausta hakevien nuorten kehonkuvaa, ja helpottamaan jo valmiiksi haastavaa diagnostiikkaa.

Avainsanat: Nuorisopsykiatria, psykiatria, ruumiinkuva, sukupuoli-identiteetti

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Has general population adolescents' body image changed alongside the increase in the need for gender identity services?

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ABSTRACT

Objectives

To examine body image among general population adolescents and possible changes therein during a period when adolescent gender identity concerns appear to have increased, and to compare population adolescents' body image to that of adolescents seeking gender reassignment.

Materials and methods

Two similar surveys in upper secondary schools in the Tampere city area with a five-year interval during the years 2011-2017. Comprising both time points, a total of 1,102 female and 644 male adolescents participated in the study and provided acceptable data. Clinical sample collected retrospectively from the case files of 102 adolescents (16 birth-assigned males and 86 birth-assigned females) seeking gender reassignment in the nationally centralized adolescent gender identity service of Tampere University Hospital in the period 2011-2017. Body image was measured using the Body Image Scale (BIS) in both the clinical and the general populations samples.

Results

Female adolescents were less satisfied with all aspects of their bodies than males but nevertheless scored average in the satisfied range in BIS. BIS total and subscale scores did not differ statistically significantly between 2012 and 2017 in either sex. Adolescents seeking gender reassignment scored higher in BIS total and subscales than adolescents of either sex in population, and into dissatisfied range.

Conclusion

Even if seeking help for gender dysphoria has increased, general population adolescents' body image has remained unchanged over an interval of five years.

Keywords: Body image, adolescents, population, gender dysphoria

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INTRODUCTION

Body image is a subjective perception of an individual's appearance, a comprehensive psychological experience comprising thoughts, beliefs, feelings and behaviours related to one's physical appearance (1). It is influenced by several different aspects such as age, psychological, social and cultural factors (2–4). Body image begins to form in early childhood and the formation continues for the rest of our lives. Maltreatment and factors threatening physical integrity predispose to disturbed body image (5–7). Disturbed body image may manifest as excessive anxiety related to how individuals feel about their appearance, for example, body build such as muscles or thigh size, genitals, and a feeling of being unattractive (8,9). Body dysmorphic disorder refers to a condition in which the individual is constantly preoccupied with one or more slight or imagined defect in appearance that causes significant distress or impairment in social, occupational or other areas of functioning (10).

One of the developmental tasks of adolescence is to become acquainted with the changed body, to accept it, and to develop a healthy body image. The childhood image of one's appearance is replaced by a whole new one, when the body undergoes a greater change during puberty than at any other stage of life. Increased interest in one's appearance during adolescent years may be a result of this (11). There is a significant gap between genders in this development task of adolescence, as boys tend to be more satisfied than girls with their changing bodies (12,13). Female adolescent physical puberty includes an increase in adipose tissue as well as weight gain (14). These characteristics are incongruent with current socio-cultural ideals regarding appearance, consequently making female adolescents more dissatisfied with their own bodies and more susceptible to psychiatric disorders related to body image (15,16). However, not only female adolescents experience dissatisfaction with their bodies. In male adolescents, body dissatisfaction often focuses on muscles and weight (17,18). Body image concerns predispose young people to disturbed eating behaviour, depressive symptoms and anxiety (12,19,20). Impaired body image can be both a precursor of mental disorders and a consequence of them. Body image concerns are not only associated with appearance-related mental disorders but also anxiety disorders and post-traumatic stress disorder after childhood sexual abuse. A broad range of psychiatric disorders predispose to a more negative body image (5).

Gender identity is an individual's perception of which gender one belongs to. The exact mechanism of gender identity formation is unknown. Most likely, the development of gender identity is an outcome of a complex interaction between biological, environmental and psychological factors (21). Gender dysphoria refers to anxiety and distress related to perceived incongruence between biological sex and experienced gender. The distress relates to body image, especially to primary and secondary sex characteristics (22,23). The DSM-5 defines gender dysphoria as a strong desire to be of a gender other than one's assigned gender and to be treated as belonging to a gender other than one's assigned gender, a significant incongruence between one's experienced or expressed gender and one's sexual characteristics and a strong desire to be rid of one's sexual characteristics due to incongruence with one's experienced or expressed gender (24).

The number of children and adolescents seeking gender identity services has increased throughout the Western world (25). While before the 2000s, minors contacting gender identity services were mainly prepubertal natal boys, nowadays adolescent natal females predominate (26,27) The aetiology of gender dysphoria is not precisely known, nor are the reasons for the increase in the number of young people seeking gender identity services. The emergence of this phenomenon may be due, for example, to awareness of the availability of treatment, depathologization of sex-discordant gender identities and increasing social acceptance (28). The visibility in the social media of transgender identities may also influence young people's perceptions of themselves. The proportion of adolescents experiencing gender dysphoria or identifying as transgender may also be increasing in the population (29,30).

Gender identity and its formation are strongly associated with an individual's physical and perceptual appearance. Earlier research has shown that female gender and femininity are a risk factor for body dissatisfaction (12,15,31). According to a study of clinical data (32), the establishment of gender identity has an impact on body satisfaction in adolescents with gender dysphoria. Those diagnosed with persistent gender dysphoria in adolescence reported greater dissatisfaction with primary and secondary sex characteristics of the body and neutral body characteristics than those with temporary feelings of gender dysphoria (32). In one study, about a third of adolescents and young adults seeking gender reassignment perceived themselves as too big, and it was also noticed that both desire to lose weight and to gain weight was associated with suicidality in this sample (33). Finally, in a qualitative study among transgender-identifying youth recruited through interest groups, 70% of participants expressed some degree of dissatisfaction with their bodies, not only with the gender characteristics but also particularly with body size (34).

The research on body image in adolescents has concentrated mainly on the relationship between weight- and size-related concerns and mental health. A more comprehensive picture of adolescents' satisfaction or dissatisfaction with their different body parts is lacking. The increase of adolescents contacting gender

identity services (25) and the simultaneously observed increase of adolescents experiencing feelings of gender dysphoria in general population (29) may relate to changes in adolescents' perceptions of their bodies and body image in the population. On the other hand, knowledge about general population adolescents' body image and possible changes therein is needed for reference in the clinical assessment of adolescents contacting gender identity services due to feelings of gender dysphoria.

The aim of this study was to gain understanding of the extent to which adolescents in general population are satisfied/dissatisfied with their various body parts, and to contrast the body image of adolescents seeking medical gender reassignment with that of their peers in general population. More specifically, we sought answer to the following questions:

1. How satisfied/dissatisfied are middle to late adolescents in general population with their various body parts, overall body image, and gendered and neutral body parts?
2. How does body image differ between female and male adolescents in general population?
3. Has adolescents body image changed from 2012 to 2017, when there has been a considerable increase in adolescents seeking gender reassignment?
4. How does the body image of adolescents seeking gender reassignment differ from that in general population?

MATERIALS AND METHODS

Participants

The data used in this study were collected from upper secondary schools in the Tampere city area in southern Finland. In the academic year 2012–2013, three upper secondary schools participated in the survey, and in 2017 there were four participating upper secondary schools. All students present on the day of the survey were invited to participate. Prior to completing the survey, students were informed both in writing and orally about the anonymity and voluntary nature of the survey, as well as their right to withdraw at any time if they were unwilling to participate. The survey questionnaire was completed under the supervision of a teacher in the classroom. The teacher ensured that everyone had enough privacy to respond to the questionnaire but did not interfere in the process. In the first wave, students responded to a

pencil-and-paper survey and in the second wave they responded online. Consent to participate in the study was given by returning the sealed envelope or by pressing the “done” button in the internet survey. To ensure anonymity, no identifying data were collected in either wave. A total of 401 females and 318 males participated in 2012-2013, and 701 females and 326 males participated in 2017. The population sample had a mean (sd) age of 17.1 (0.87) years. Over this period, the percentage of adolescents in general population reporting potentially clinically significant feelings of gender dysphoria increased fourfold (29).

Clinical sample

The data of the clinical sample used in this study were collected retrospectively from the case files of adolescents seeking gender reassignment at the nationally centralized adolescent gender identity service of Tampere University Hospital whose assessments had been completed in the period 2011-2017. The chart information on 102 adolescents (16 birth-assigned males and 86 birth-assigned females) was used in the present analyses. At the time of the assessment, the patients had not yet received hormonal intervention. The clinical sample had a mean (sd) age of 16.8 (1.0) years. Over this period, the annual number of referrals of minors to gender identity assessment in Finland increased almost sixfold (29).

Measures

Body image was measured by the Body Image Scale (BIS) (35). The BIS is a 30-item list of body parts and features. These parts are rated on a 5-point scale from very satisfied (1) to very dissatisfied (5). If a participant notes the neutral to very dissatisfied option (scores 3, 4, or 5) for any item, that individual is asked if they would like to alter this body part by means of medical or surgical treatment. A total BIS score is reported as the mean (sd) of the item scores, thus ranging 1-5. Scores higher than 3 are considered indicative of clinically significant body dissatisfaction, and are assumed to capture clinically significant gender dysphoria. The BIS items can be divided into three groups: the primary gendered (primary sex characteristics), secondary gendered (secondary sex characteristics) and neutral body parts (nose, shoulders, chin, calves, hands, Adam's apple, eyebrows, face, feet and height). Three subscale scores are similarly reported as mean (sd) values of the items in these three groups. There are two versions of the BIS, one for each gender. The differences emerge in primary gendered parts (from males eliciting satisfaction with penis, scrotum, testes; from females, clitoris, vagina, ovaries). Higher scores from the questionnaire indicate higher degree of body dissatisfaction(35). The BIS is routinely used in clinical gender identity assessments with all adolescents contacting the gender identity service in Tampere University Hospital due

to features of gender dysphoria. The BIS scores of patients with Gender Dysphoria have been suggested to decrease (=improve) with hormonal and surgical treatments that alter sexually dimorphic characteristics of the body in both adults and adolescents (35,36). To the best of our knowledge there is yet no information about the distribution of BIS scores in general adolescent population.

Statistical analyses

Mean (sd) and median scores of the BIS total and subscales were compared between males and females in general population, using t-test and Kruskal-Wallis test respectively. Item-by-item comparisons of all BIS items between males and females were carried out using cross-tabulation with chi-square test (Fisher's exact test where appropriate). Similarly, BIS total and subscale scores were compared between males in general population and birth-assigned males and females in the clinical sample, and females in general population and birth-assigned females and males in the clinical sample. Using Bonferroni correction for multiple comparisons, the cut-off for statistical significance in item-by-item comparisons set at $p < 0.002$. The correlations between age and the BIS scores were evaluated using Pearson's correlation coefficient.

RESULTS

Body image of adolescents in general

The mean and median values of BIS total score and all BIS subscales were within the satisfied range (below 3) among both male and female adolescents in general population, but female adolescents were less satisfied with all aspects of their bodies than were males (Table 1).

In item-by-item analysis, over one fifth of female adolescents were dissatisfied with their breasts, thighs and weight, and over one sixth were dissatisfied with their waist, figure, buttocks and muscles (Table 2). Of male adolescents, over 10% were dissatisfied with their muscles, facial hair, weight and biceps.

Dissatisfaction with shoulders, Adam's apple, height, biceps, voice and chest was equally common among both sexes in the population. Male adolescents were more commonly dissatisfied than females only regarding facial hair, otherwise dissatisfaction with shared body parts was more common among females (Table 2).

Mean and median values of BIS total score and the three BIS subscales did not differ statistically significantly between 2012 and 2017 either among females or among males in the population sample. Among males, item-by-item analysis did not reveal changes in dissatisfaction between 2012 and 2017. Among females, there was a statistically significant decrease between 2012 and 2017 in dissatisfaction with their hips (17.2% vs. 10.4%, $p=0.001$), and borderline significant decrease in dissatisfaction with thighs (34.1% vs. 25.4%, $p=0.002$).

Differences in Body Image Scale between general population and adolescents seeking gender reassignment

Clinical sample adolescents of both sexes scored higher than population adolescents of either sex on BIS total score and on all its subscales (Table 1).

The role of age

Age was not statistically significantly correlated with BIS total score nor with any BIS subscale scores among either general population or clinical sample.

DISCUSSION

Our results in this pioneer study regarding the evaluation of the body image of adolescents in general population with the BIS are surprising. Population adolescents in Finland are rather satisfied than dissatisfied with their bodies, scoring below the dissatisfied range (<3) in all three subscales on BIS. Female adolescents were less satisfied with all aspects of their bodies than males, as expected, but nevertheless scored average in the satisfied range on BIS. BIS total and subscale scores did not differ statistically significantly between 2012 and 2017 in either sex despite the increase of annual number of referrals of minors to gender identity assessment in Finland. As expected, adolescents seeking gender reassignment scored higher in BIS total and subscales than adolescents of either sex in population, and into dissatisfied range.

How satisfied/dissatisfied are middle to late general population adolescents with their various body parts, total body image, and gendered and neutral body parts?

The aim of this study was to evaluate adolescents' body image by examining how satisfied/dissatisfied middle to late general population adolescents are with their various body parts, total body image, and gendered and neutral body parts. According to our findings, middle to late general population adolescents in Finland are relatively satisfied with their bodies and have a relatively good overall body image, being rather satisfied than dissatisfied with primary gendered, secondary gendered and neutral parts of their bodies. On the other hand, more than one in five female adolescents were dissatisfied with their breasts, thighs, waist, buttocks and figure, and over 10% of male adolescents were dissatisfied with their muscles, facial hair, weight and biceps. These findings confirm earlier research reporting that muscles, (body) hair growth and weight were the primary sources of body dissatisfaction among males (18), and body parts associated with feminine curves and adipose tissue among females (37).

How does body image differ between female and male adolescents in general population?

Our study confirms the existing literature on gender differences in body image concerns (12,13). According to our results, female adolescents in general population were more dissatisfied with their bodies than were male adolescents, and this emerged in the BIS total score and all the subscales in relation to both gendered and neutral body dimensions. When there were item level differences in dissatisfaction with specified body parts, females were almost without exception more commonly dissatisfied than males. Their dissatisfaction also peaked in body parts related to feminine curves and thus feminine appearance. This may be due to social pressure to be slim seems to influence women more than men (38). Also, it has been proposed that women internalize socio-cultural ideals more than men (15) which further exposes female adolescents to body dissatisfaction. Unfortunately, our data do not reveal whether the experienced dissatisfaction was due to their body parts appearing too pronounced or big to them, or perhaps inadequate. One interesting question arises as to whether anxiety towards one's body is caused by female gender itself, and desire to get rid of the female gender because of its social status.

Has the body image of adolescents in general population changed between 2012 to 2017, when there was considerable increase in adolescents seeking gender reassignment?

What is interesting is that adolescents' body image had hardly changed from 2012 to 2017. Our results are contrary to what we expected. Over the period the data had been collected the importance of social media

increased significantly, likewise the powerful influence of advertisements and social models on adolescents (39). Young people are thus exposed to greater pressure regarding personal appearance pressures. The proportion of adolescents in the general population expressing potentially clinically significant feelings of gender dysphoria also increased (29). According to our findings, female adolescents' dissatisfaction with their hips and thighs had, surprisingly, decreased over time. This may reflect a change towards curvier body ideals (40,41), which could lead to a more positive body image among female adolescents who earlier would have been more insecure about their feminine features. At the same time, studies have also shown that women's exposure to not only slim body ideals but also to athletic or curvy ideals may be harmful to their body image (42). Changes in male adolescents' body image would also have been expected, as men's exposure to images of idealized male bodies has been found to increase body dissatisfaction (17), however, no statistically significant change occurred. The increased search for gender identity services may also suggest that adolescents' problems with body image and dissatisfaction with their bodies has increased. However, neither male nor female adolescents' dissatisfaction with their respective body parts increased. With the increasing media influences and appearance pressures arising from them, adolescents at large may also have learned to cope more effectively with such pressures.

How does the body image of adolescents seeking gender reassignment differ from that of adolescents in general population?

As expected, both male and female adolescents seeking gender reassignment were more dissatisfied in all three BIS subscales than adolescents in general population. Not only were they dissatisfied with their gendered and secondary gendered body parts but also with their neutral body parts. The same effect has been reported in earlier studies evaluating body dissatisfaction in adolescents and (young) adults with gender dysphoria (22,43,44). Some studies among sexual and gender minorities have suggested that it is specifically feminine identity that predisposes to distorted body image, more than (female) sex (31,45), but in our data, adolescents in the clinical sample scored similarly regardless of sex and gender identity. Adolescents suffering from gender dysphoria were also more dissatisfied with their neutral body parts than general population adolescents of either sex. These results suggest that gender dysphoria is not limited to dissatisfaction with primary and secondary sex characteristics but also affects, or is affected by, adolescents' overall body image. Overall, males in general population were most satisfied with their bodies followed by population females, and least satisfied were adolescents presenting in gender identity service seeking gender reassignment.

The vast majority (>85%) of adolescents in the age group of the population sample attend upper secondary education in Finland. The data can thus be considered representative of the age group. However, Finnish adolescents attending upper secondary school (as opposed to vocational school) are often from families with higher social and economic status, which may limit the generalizability of the findings to unselected adolescent population samples. Unfortunately, puberty status was not measured, but from the mean (sd) age information it can be concluded that practically all subjects were post-pubertal. Also, age was not statistically significantly correlated with BIS total score nor with any BIS subscale. The clinical data used in this study is of relatively limited size, as so few adolescents sought gender reassignment during this period. Despite being small, the clinical data is thus very representative of those seeking gender reassignment during their adolescent years.

It has been demonstrated that some adolescents deliberately misrepresent themselves in survey studies, exaggerating their belonging to minorities as well as their problem behaviours, symptoms and psychosocial problems, and that this phenomenon influences surveys on topics that are very prominent in society, such as gender identity (29,30). With increasing exposure to appearance-related (social) media influences, body image and body dissatisfaction could also be a topic of increased facetious responding. This would likely result in a worse picture of adolescents' body image and body satisfaction over time. No such change occurred in the present data, which suggests that the role of inaccurate responding, always a possibility in self-report surveys, at least did not increase over time.

To the best of our knowledge, no other study has been presented using the Body Image Scale to evaluate adolescents' body image in non-clinical populations. The Body Image Scale evaluates body image satisfaction or dissatisfaction in greater detail and more comprehensively, while earlier studies have focused exclusively on weight issues or on adolescents associated with mental and eating disorders. However, the BIS focuses solely on a cognitive-affective component of body image, namely satisfaction. A more comprehensive picture could be achieved by also exploring the perceptual and behavioural aspects of body image (1,46).

CONCLUSION

Female adolescents in general population expressed greater dissatisfaction with a variety of body parts compared to male adolescents, but their overall body image was nevertheless positive rather than negative. The body image of adolescents in general population did not change over the five-year interval. Adolescents seeking gender reassignment differed from adolescents in general population by displaying dissatisfaction with both gendered and neutral body parts. Future research should continue from cognitive to affective and behavioural aspects of body image in adolescence, and to exploring the role of changes in gender roles for body image.

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Table 1. BIS total and all three subscales mean and median scores and comparisons between groups

	mean(sd)				pop. females vs. pop. males	pop. females vs. clinical birth- assigned females	pop. females vs. clinical birth- assigned males	pop. males vs. clinical birth- assigned males	pop. males vs. clinical birth- assigned females
	female pop.	male pop.	clinical birth- assigned females	clinical birth- assigned males					
BIS total	2.3 (0.7)	1.9 (0.7)	3.4 (0.5)	3.5 (0.5)	<0.001	<0.001	<0.001	<0.001	<0.001
BIS gendered	2.2 (0.7)	1.9 (0.8)	4.1 (0.6)	4.4 (0.6)	<0.001	<0.001	<0.001	<0.001	<0.001
BIS secondary gendered	2.4 (0.8)	1.9 (0.8)	3.5 (0.6)	3.5 (0.9)	<0.001	<0.001	<0.001	<0.001	<0.001
BIS neutral	2.2 (0.7)	1.8 (0.7)	2.8 (0.6)	3.0 (0.6)	<0.001	<0.001	<0.001	<0.001	<0.001
	Median (IQR)								
BIS total	2.3 (0.9)	1.9 (1.0)	3.4 (0.6)	3.4 (0.8)	<0.001	<0.001	<0.001	<0.001	<0.001
BIS gendered	2.1 (0.9)	2.0 (1.1)	4.3 (0.6)	4.6 (1.0)	<0.001	<0.001	<0.001	<0.001	<0.001
BIS secondary gendered	2.4 (1.0)	1.9 (1.1)	3.5 (0.7)	3.5 (0.9)	<0.001	<0.001	<0.001	<0.001	<0.001
BIS neutral	2.2 (1.0)	1.8 (1.0)	2.9 (0.8)	3.0 (1.3)	<0.001	<0.001	<0.001	<0.001	<0.001

BIS total mean and median scores and gendered, secondary gendered and neutral subscale mean and median scores by among adolescents in general population and among clinical sample of adolescents seeking gender reassignment, with comparison between groups. Between clinical sample males and females, none of the comparisons yielded statistically significant differences. Mean (sd) values are compared with t-test, medians (IQR) with Kruskal-Wallis test

Table 2. The percentage of dissatisfied and very dissatisfied item-by-item and comparison between male and female adolescents in general population

	males n=651	females n=1108	p
Nose	5.3	15.8	<0.001
Shoulders	5.8	9.7	0.003
Hips	4.7	12.9	<0.001
Chin	3.9	10.7	<0.001
Calves	5.3	10.6	<0.001
Breasts	6.6	20.7	<0.001
Hands	5.0	7.2	0.05
Adam's apple	2.9	2.0	0.2
Scrotum/Vagina	2.8	4.5	0.05
Height	8.8	11.9	0.03
Thighs	6.3	28.6	<0.001
Arms	5.0	12.4	<0.001
Eyebrows	2.4	5.7	0.001
Penis/Clitoris	6.6	2.2	<0.001
Waist	4.6	18.4	<0.001
Muscles	11.5	19.3	<0.001
Buttocks	5.2	19.4	<0.001
Facial hair	11.9	4.1	<0.001
Face	5.1	11.3	<0.001
Weight	10.6	28.7	<0.001
Biceps	11.2	11.7	0.4
Testes/Ovaries	2.4	4.2	0.04
Hair	4.4	11.7	<0.001
Voice	5.0	7.3	0.04
Feet	4.1	11.6	<0.001
Figure	6.0	18.0	<0.001
Body hair	4.4	16.4	<0.001
Chest	5.7	4.2	0.1
General appearance	3.3	11.0	<0.001
Body build	5.0	13.9	<0.001

Proportion of respondents dissatisfied or very dissatisfied with their body parts item-by-item in 16-19- year-old adolescent general population in Finland. (%) Differences between males and females are compared using chi-square statistics, and differences statistically significant after Bonferroni correction for multiple testing are presented in bold face

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