Body dissatisfaction predicts onset of depression among adolescent females and males: a prospective study

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Word count (excluding title page, abstract, references, figures and tables):

3160

Abstract

Rationale

Body dissatisfaction is prevalent in mid-adolescence, and may be associated with onset of depression.

Objective

The study assessed the influence of body dissatisfaction on the occurrence of later depressive episodes in a population-based sample of British adolescents.

Method

Participants were 2,078 females and 1,675 males from the Avon Longitudinal Study of Parents and Children (ALSPAC) cohort. Logistic regression was used to test if body dissatisfaction at 14 years old predicted the onset of depressive episodes at 18 years old, controlling for baseline depression.

Results

Among females, body dissatisfaction predicted mild (OR=1.63, 95% CI = 1.31, 2.04), moderate (OR=1.67, 95% CI = 1.28, 2.18), and severe depressive episodes (OR=1.84, 95% CI = 1.09, 3.12). Among males, body dissatisfaction predicted mild (OR=1.50, 95% CI = 1.00, 2.25) and severe depressive episodes (OR=2.85, 95% CI = 1.18, 6.87) at 18 years of age.

Conclusions

This is the first prospective study to demonstrate that body dissatisfaction in adolescence predicts the occurrence of later depressive episodes in a cohort born in the early 1990s. The findings highlight that body dissatisfaction is a public health concern.

Key words: Body dissatisfaction; depression; ALSPAC; adolescence

What is already known on this subject?

- Body dissatisfaction is prevalent in mid-adolescence, but in the field of public health is rarely deemed an epidemic;
- Depression is the leading cause of disability worldwide, and its incidence rises sharply after puberty, with 4% of adolescents affected by it;
- Some studies have found an effect of body dissatisfaction on depression, but no robust prospective study has been conducted among adolescents born in the 1990s.

What this study adds?

- Body dissatisfaction at 14 years of age predicted the prevalence of mild, moderate, and severe depressive episodes among females, and of mild and severe depressive episodes among males at 18 years of age, whilst controlling for initial levels of depression;
- Such increased chances of experiencing depressive episodes range from 50% to 285%;
- Findings highlight body dissatisfaction as a public health issue and point towards interventions targeting body dissatisfaction from early adolescence.

Introduction

Body dissatisfaction refers to negative subjective evaluations of one's physical body.[1] It has global prevalence among adolescent populations,[2, 3] with up to 61% of adolescents experiencing some degree of dissatisfaction with their body[3], and growing trends worldwide[2, 4]. Studies have shown that women tend to be more dissatisfied in the Americas compared to other world regions[2] and in urban, rather than rural, contexts[2], with no effects of ethnicity[5]. Prevalence of body weight dissatisfaction in Western countries ranges between 34.1% and 61.8% among teenage girls, and between 14.1% and 39.9% among teenage boys[3]. British figures[3] derived from census data also show that among female teenagers satisfaction with appearance has decreased between 2000 and 2014.

Sociocultural theory proposes dominant appearance ideals (i.e., the "thin" youthful ideal for females and "muscular" ideal for males) are transmitted to young people via three sociocultural sources: the media, parents, and peers[6]. The model postulates two psychological processes through which these influences have an impact on body image: internalisation of appearance ideals (i.e., the extent to which a person cognitively "buys into" socially determined ideals of beauty) and appearance comparisons (i.e., the extent to which a person compares their own appearance with that of others). This model has received substantial support[7,8]; and scholars have also highlighted the prominent impact of the media in body dissatisfaction processes[9,10]. With regard to changes of body image across appearance; there is no clear consensus on how body image changes within adolescence. Wertheim and Paxton[11] state that among female adolescents, once body dissatisfaction is established, it "does not appear to go away through simple development", while among boys there is still unclarity on how body dissatisfaction evolves with time[12].

Body dissatisfaction has been identified as a risk factor for disordered eating, [13, 1] a series of risky health behaviours[14] and poor psychological health.[13, 15, 16] However, in the field of public health, the pervasive issue of body dissatisfaction is not widely viewed as a concern. As noted by scholars,[14, 16] while extensive attention is directed toward the epidemic of obesity, body dissatisfaction is rarely deemed an epidemic, despite its growing incidence[2, 4]. The current study examines the role of adolescent body dissatisfaction in contributing to one of the major public health issues of present times: depression.

Depression is the leading cause of disability worldwide,[18, 19] affecting more than 300 million people. The WHO estimated that in 2015, depressive disorders led to over 50 million Years Lived with Disability (YLD), representing more than 7% of global YLDs.[19] Depression is also a well-recognised risk factor for suicide, with affected men and women being 20.9 and 27 times, respectively, more likely to commit suicide than the general population.[20] The incidence of depression, especially in girls, rises sharply after puberty. While only 1% of children suffer from depression,[21] the figure grows to around 4% in adolescence.[22] It is therefore crucial to target depression among adolescents, which can be aided by identifying its early risk factors.

The current study focused on examining body dissatisfaction as a risk factor for later adolescent depression. Stice and Bearman[23] proposed that body dissatisfaction directly contributes to increases in depressive mood, specifically among young women, due to appearance being a critical evaluative dimension for girls in Western culture. One of these adverse consequences is the effect on mental health. Empirical longitudinal studies have confirmed that body dissatisfaction predicts depression among females.[15, 24-29] However, most of these studies were conducted in the early 2000s, with participants born in the 1980s. Since body dissatisfaction is increasing over time[2, 4], it is crucial to explore the influence of body dissatisfaction on depressive outcomes among Millennial generations – e.g., individuals born between 1981 and 1997.[30] Outcomes might differ from previous cohorts also due to the important role that the internet, technology, and social media has on lifestyles of more recent generations. In addition, most empirical research on body dissatisfaction and depression has been conducted in the United States,[25-29]. Relatively little attention has been given in European contexts – with some exceptions:[5, 24] – and among male samples, especially in the United Kingdom (UK).

Given these needs, the current study aimed to extend the limited literature on the prospective relationship between body dissatisfaction and depression for both females and males, based on the British population-based prospective study of the Avon Longitudinal Study of Parents and Children (ALSPAC). It constitutes the first UK-based population study examining the effects of body dissatisfaction on depression based on the ALSPAC study among individuals born in the early 1990s.

Methods

Study participants

ALSPAC is a population-based prospective study of women and their children living in the region of Avon, UK.[31-33] The children from 14,541 pregnancies were enrolled, born between 1 April 1991 and 31 December 1992. 13,988 children were alive at 1 year. An additional 713 children were enrolled later on in childhood (phases 2 and 3). All mothers enrolled gave informed and written consent; children also confirmed their consent at later timepoints. For the current study, only adolescents who completed the questions on depressive behaviour at 18 years were included (n = 3,753).

The study website contains details of all the data that are available through a fully searchable data dictionary (http://www.bris.ac.uk/alspac/researchers/data-access/data-dictionary). Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees. A full list of the research ethics committee is available at: http://www.bristol.ac.uk/alspac/researchers/research-ethics/. Informed consent for the use of data collected via questionnaires and clinics was obtained from participants following the recommendations of the ALSPAC Ethics and Law Committee at the time.

Measures

Body dissatisfaction at mean age 14.04 years, hereby referred to'as '14 years', was assessed by a series of questions asking individuals to rate their satisfaction with eleven body parts (weight, figure, body build or breasts, stomach, waist, thighs, buttocks, hips, legs, face, hair) on a 5-point Likert scale, from 'extremely satisfied' to 'extremely dissatisfied'. This represents the baseline point of the analyses. Questions differed slightly between the female and male questionnaire version ('body build' in the male version was replaced by 'breasts' in the female version). Cronbach's alpha was .95 for the male version and .90 for the female version in this study. In order to obtain the body dissatisfaction variable, a continuous score was derived by averaging the eleven values. Higher values indicated higher dissatisfaction (min value = 1; max value = 5). Despite the scale not being validated, this is very similar to the Body Areas Satisfaction Scale of the MBSRQ-3[34] and Body Shape Satisfaction Scale[35], which both assess satisfaction with the face, hair, lower torso, mid torso, upper torso, muscle tone, weight, height, and overall appearance. Depression was assessed clinically by a nurse at mean age 17.80 years old (hereby 18 years old) using the Computerised Interview Schedule –

Revised (CIS-R)[36]. This asks questions about a range of symptoms and can be used to assign International Classification of Diseases-10 (ICD-10) diagnoses of depression and anxiety disorders. The CIS-R elicits responses to symptoms of depression experienced in the past week, and provides a diagnosis of depression according to ICD-10 criteria. ICD-10 criteria for mild, moderate and severe depression were used to categorise depression severity. Three models (mild, moderate, severe depressive episode) were included in the analysis.

Statistical analysis

Data were analysed using STATA version 14.[37] Analyses were conducted for males and females separately, given the different prevalence of body dissatisfaction and depression for females and males. Based on the starting sample, levels of missing information across variables were between 7.9% and 24.9% in the male sample and between 0.3% and 14.9% in the female sample. Data were indicated as missing at random (MAR;[38]), hence data were imputed using multiple chained equations (MICE;[39]) following the MAR assumption with the Stata ice command. Thirty imputed datasets were created, and the Monte Carlo error estimation confirmed that the number of imputations was sufficient.[40] There were no relevant differences between the imputed analysis (presented here), and complete case analysis (available as supplementary material). Responses at 14 years to the weight and figure body satisfaction questions are presented, and compared for males and females using unpaired t-tests. Mean (and standard deviation) body satisfaction scores are calculated for males and females. The prevalence of mild, moderate and severe depression at 18 years is cross-tabulated with sex (as assigned at birth), and compared using Chi-squared tests. The odds of the three depression outcomes were estimated using logistic regression. Three separate logistic regression models are presented (mild, moderate, and depressive symptoms), and the analyses were done in comparison to the rest of the sample. A multinomial model was not used because the interest was in how the coefficients changed taking each of the possible outcomes in turn; the disadvantages in terms of loss of efficiency were not a significant concern in light of the size of the sample. The efficiency loss should be minor when the response category having highest prevalence is the baseline[41], as in this case.

Recognised predictors of depression were included as covariates in the final models, as potential confounders. These included body mass index (BMI), measured by a nurse at 10 years; ethnicity of the child (White vs non-White, because there were not enough non-White

participants in the sample to power analyses with more categories); and maternal variables (paternal characteristics are not available in the ALSPAC cohort), including mother's highest educational qualification (categorical; three derived categories), maternal depression (dummy assessing whether the mother had suffered depression in the previous two years, assessed when the study children were a mean age of 12.1 years via postal questionnaires) (Table 1). Covariates were selected based on previous evidence that BMI [42,43], body image [43,44], and maternal depression can predict depression[45].. In order to run a prospective analysis, depression at 14 years was also included as a covariate. Depression at 14 years of age was assessed with the DAWBA questionnaire which can be used to generate Diagnostic and Statistical Manual of Mental Disorders diagnoses as defined by the Diagnostic and Statistical Manual of Mental Disorder, 4th Edition, and was measured clinically.

Results

Table 1 summarises socio-demographic characteristics of respondents.

Table 1: Descriptive statistics		
	Females (n = 2,078)	**Males (n = 1,675)**
Age, Mean	17.8	17.8
Child ethnicity, %		
White	96.0	96.0
Non-White	4.0	4.0
Mother had history of depression, %	20.5	18.9
Mother's occupation, %		
Professional	4.3	6.2
Managerial and technical	34.3	36.6
Skilled non-manual	41.9	39.6
Skilled manual	3.2	3.2
Partly skilled	13.5	13.1
Unskilled	2.8	1.3
Mother's educational qualification, %		
Up to 16 years	51.1	47.9
Up to 18 years	28.8	30.5
Post 18 years	20.1	21.6

Descriptive statistics related to body dissatisfaction are discussed below. The body dissatisfaction 11-item scale scores indicate that both females (*M* = 2.54, *SE* = .01, SD = 0.82) and males (*M* = 2.14, *SE* = .01) tended to be mildly satisfied with their body overall. However, females tended to be more dissatisfied overall with their body than males, *t*(2980) = -14.13,

$p < .001$. Looking at specific items (Table 2), values ranged from 2.17 to 3.06 for females and from 2.04 to 2.36 for males. Females tended to be dissatisfied with their thighs, stomach, and weight, and satisfied with their hair and hips. For males, the body parts associated with more dissatisfaction were body build, stomach, and hips. Hair, weight, and legs did not seem to raise concern for males.

Table 2: Dissatisfaction with eleven body parts

	Females		Males	
Variable	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
Weight	2.66	1.21	2.10	1.02
Figure	2.58	1.52	2.23	.95
Body build or breasts	2.57	1.10	2.36	.98
Stomach	2.81	1.28	2.32	1.07
Waist	2.52	1.14	2.22	.99
Thighs	3.06	1.25	2.19	.97
Buttocks	2.56	1.10	2.23	.91
Hips	2.47	1.06	2.20	.87
Legs	2.58	1.17	2.04	.87
Face	2.56	1.10	2.29	.90
Hair	2.17	1.02	2.05	.90
Total body dissatisfaction scale	2.54	.81	2.14	.73
Note: Body dissatisfaction scale ranges from 1 to 5 (with 5 being highest dissatisfaction).				

To give a more precise picture, Table 3 shows prevalence of dissatisfaction with two items of the body dissatisfaction scale - weight and figure - derived from the weight and figure items, given that they are the most common sources of distress. At 14 years of age, 32.4% of females and 14.3% of males were dissatisfied with their weight, and 27.2% of females and 13.8% of males were dissatisfied with their figure.

Table 3: Body dissatisfaction items at 14 years old by sex

	Females		Males	
Body dissatisfaction	**Satisfaction with weight (%)**	**Satisfaction with figure (%)**	**Satisfaction with weight (%)**	**Satisfaction with figure (%)**
Extremely satisfied	14.7	26.6	26.6	13.4
Moderately satisfied	40.7	46.8	46.8	46.3
Can't decide	13.4	12.3	12.3	14.1
Moderately dissatisfied	24.5	12.6	12.6	19.8
Extremely dissatisfied	6.7	1.7	1.7	6.4

Table 4 reports incidence of mild, moderate, and severe episodes of depression at 18 years old among the female and male samples, based on individuals who completed the relevant question. This shows that more females than males tended to experience mild and/or moderate depressive episodes.

Table 4: Prevalence of depressive episode at 18 years old			
	Sample		**Chi square p-value**
Severity of depressive episode	**Females (n = 2,078) (%)**	**Males (n = 1,675) (%)**	
Mild	10.2	4.6	>.001
Moderate	6.7	2.6	>.001
Severe	1.4	0.7	.061

Logistic regression

Logistic regressions (Table 5) showed that body dissatisfaction at 14 years of age predicted the onset of mild, moderate, and severe depressive episodes among the female sample four years later (at 18 years). Among the male sample, it predicted mild and severe depressive episodes four years later (at 18 years). The full models are provided as Supplementary Materials.

Table 5: Odds ratios for prevalence of mild, moderate and severe depressive episodes at 18 years associated with a unit increase in the body dissatisfaction scale at 14 years*							
	Sample	**Mild depressive episode**		**Moderate depressive episode**		**Severe depressive episode**	
		OR (CI)	**p-value**	**OR (CI)**	**p-value**	**OR (CI)**	**p-value**
Body dissati-sfaction	**Females**	1.63 (1.31, 2.04)	< 0.001	1.67 (1.28, 2.18)	<0.001	1.84 (1.09, 3.12)	0.022
	Males	1.50 (1.00, 2.25)	0.049	1.63 (.91, 2.91)	0.097	2.85 (1.18, 6.87)	0.019
*Controlling for depression at 14 years old, BMI at 10 years old, ethnicity, mother's history of depression, mother's socio-economic status and highest education qualification.							

Discussion

The current study examined the prospective association between body dissatisfaction and mild, moderate, and severe depressive episodes among a sample of British females and males born in the early 1990s. Findings show that body dissatisfaction at 14 years of age predicted the prevalence of mild, moderate, and severe depressive episodes among females, and of mild and severe depressive episodes among males at 18 years of age, whilst controlling for

initial levels of depression. These findings highlight the importance of recognising body dissatisfaction as a public health concern.

Among females, each increase in the body dissatisfaction scale at 14 years old was associated with an increased chance of having at least one mild (63%; effect size range: 31% to 204%), moderate (67%; effect size range: 28% to 218%), and/or severe (84%; effect size range: 9% to 312%) depressive episode at 18 years of age, controlling for depression at 14 years old of age. Importantly, the strength of the association increased with the severity of the later depressive episode. These findings extend previous studies [30, 5, 15] examining the prospective association between early adolescent body dissatisfaction and late adolescent depressive symptoms. They indicate that these associations become stronger with the growing severity of depressive episode. The findings add support to theoretical ideas proposed by Stice and Bearman [23, 25, 27] that young women might suffer adverse psychological health conditions due to their dissatisfaction with their body. However, since the relationship between body dissatisfaction and depression persisted with control for BMI, for both females and males, the current findings also demonstrate that body image is a multi-dimensional construct not determined exclusively by BMI.

For males, each increase in the body dissatisfaction scale at 14 years of age was associated with an increased chance of experiencing at least one mild (50%; effect size range: 0% to 225%) and/or severe (285%; effect size range: 118% to 687%) depressive episode at age 18, controlling for depression at 14 years old of age. While the impact of body dissatisfaction on mild depressive episodes is comparable between females and males, the influence of body dissatisfaction on severe depressive episodes is stronger in the male sample. These findings contrast with theoretical ideas from Bearman and Stice[25] that body dissatisfaction is a female-specific predictor of depression. Other scholars have suggested that males can also be negatively affected by body dissatisfaction.[42-49] In the United States, Field et al.[48] found that being concerned about thinness was associated with a 272% increased chance of experiencing depressive episodes among males, and we have identified a similar association. The current study also adds that among young men who are dissatisfied with their body, the risk of experiencing later severe depressive episodes specifically, is notably high. While Stice and Bearman suggested that females are more sensitive to appearance ideals,[23, 25] it is possible that in the era of social media and increasing pressures on body ideals, male adolescents have also become sensitive to these pressures, which may translate into later

depressive episodes. Social media has a strong influence on how adolescents perceive their body.[50] Extensive evidence on 'newer' media has demonstrated an association between the use of Social Networking Sites (e.g., Facebook, Instagram) and body dissatisfaction.[50-52] Considering the addition of this pervasive influence on body image, coupled with the rising trends of body dissatisfaction among adolescents, it is possible that the relationship between body dissatisfaction and depression may have been exacerbated in recent years, including among male samples. It should also be noted that the slight differences between the male and female samples (e.g. the effect of body dissatisfaction on male's moderate depressive episodes not reaching significance) might be explained by the relatively small male sample. Despite this, a comparable trend across odds rations for males as well as females has been identified.

This study has a number of strengths. First, the use of a large community-based sample in one of its most recent cohorts – e.g. adolescents born in the early 1990s. This dataset is substantially larger than other study samples employed for the study of the relationship between body dissatisfaction and depression, and also more current. Second, the analyses were based on reliable clinical measures of depressive episodes, that were also classified according to the episode severity. This is a more nuanced examination and suggests that future research might also need to look at this in such a refined way.

Third, robust longitudinal statistical methods were used; controlling for baseline depression allowed stronger inferences concerning the direction of effects. Fourth, given the relative dearth of work on male body dissatisfaction, the current findings show that male body dissatisfaction, similarly to females, can have detrimental implications for psychological health, despite the lower prevalence. The findings highlight the importance of studying these effects among males, too.

Limitations include the lack of ethnic and socio-economic diversity in the ALSPAC dataset, and the relatively high level of attrition, which is common in longitudinal studies. This was addressed with multiple imputation, and the imputed analyses and complete case analyses did not vary substantially. Second, the body dissatisfaction scale used in the ALSPAC questionnaire is not a validated tool. However, the body dissatisfaction scale resembles the MBSRQ-3[34] and Body Shape Satisfaction Scale[35] very closely, which have been validated and used frequently throughout the field. Additionally, it demonstrated excellent reliability in the present study. Third, there are some limitations related to sex, which was categorized

based on assignment at birth. Therefore, it was not possible in this analysis to ascertain the effect of gender or sexual orientation despite their potential influence. Finally, no measure of pubertal development was included in the models, which could have a role in the development of body dissatisfaction. In addition, the measure of body dissatisfaction assessed in the ALSPAC questionnaires is more heavily weighted towards female appearance ideals. Hence, it is possible that this might overlook more male oriented appearance ideals and underestimate body dissatisfaction among males. This highlights the importance of developing valid instruments which capture body image among male participants.

Future research might consider exploring the role of dissatisfaction with specific body parts; as opposed to looking at body image "as a whole". Further, it may consider aspects of body image specific to males, such as muscularity, chest, arms, height, etc. The role of potential mediators such as appearance-related discrimination (teasing/bullying) as a mechanism[53] or self-esteem[54] also deserve further attention. The findings point towards interventions targeting body dissatisfaction from early adolescence, of which school-based cognitive dissonance [55,56] and media literacy programmes [57-59] have demonstrated effectiveness in improving body image and negative affect among adolescent males and females. These therefore constitute reliable avenues of intervention which can benefit adolescents in the general population. Public health efforts should adopt a more holistic approach that considers both physical and mental wellbeing. Indeed, there should be a shift from weight control to weight outcomes, and appreciation of the body in relation to its functionality as opposed to its appearance[14, 60-62]. In addition, future research might explore body dissatisfaction processes on non-white populations, since the literature is limited and contrasting[63,64].

Overall, these analyses demonstrated that each increase in the body dissatisfaction scale in mid-adolescence was associated with an increased risk of developing depressive episodes at 18 years old, and such increased chances ranged from 50% to 285% and had relatively large effect sizes, whilst controlling for baseline depression. These findings demonstrate that body dissatisfaction should be considered as a public health issue of pressing concern. Body dissatisfaction is highly prevalent among young people in the general population and has an increasing incidence; the findings indicate that reducing body dissatisfaction might be an effective strategy to reduce mental health issues.

The field should endeavour to develop a shared, holistic approach to target obesity without encouraging societal pressure for thinness, but instead focusing on promoting positive body image among young people[14].

Acknowledgements

We are extremely grateful to all the families who took part in this study, the midwives for their help in recruiting them, and the whole ALSPAC team, which includes interviewers, computer and laboratory technicians, clerical workers, research scientists, volunteers, managers, receptionists and nurses.

Funding

The UK Medical Research Council and Wellcome (Grant ref: 102215/2/13/2) and the University of Bristol provide core support for ALSPAC. This publication is the work of the authors and they will serve as guarantors for the contents of this paper. A comprehensive list of grants funding is available on the ALSPAC website (http://www.bristol.ac.uk/alspac/external/documents/grant-acknowledgements.pdf). This research was specifically funded by an internal research funding from the University of the West of England.

Competing of Interests

There are no competing interests for any author.

Contributorship Statement

All authors contributed to planning and conceptualization of the research. HLS, AS, and IB obtained the dataset and conducted data cleaning and conceptualized the scales. AB conducted data analysis and reporting. HLS, AS and IB contributed to data analysis and reporting. AS and IB were responsible for the overall content as guarantors. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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