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EATING DISORDERS, BODY IMAGE CONCERNS AND EXERCISE IN YOUNG FINNISH WOMEN

ABSTRACT

Purpose: *Body image concerns are common among women with eating disorders. Our aim was to compare body image concerns and exercise in women with and without eating disorders.* ***Methods:*** *Women diagnosed with lifetime eating disorders (n=159) and randomly selected women without eating disorders (n=163), from the 1975–1979 birth cohort of Finnish twins, completed self-report surveys that assessed body image concerns and exercise and the impact on their private, social and professional lives.* ***Results:*** *Compared to women from the general population, women with eating disorders were more likely to express excessive body image concerns, exercise nearly every day, set goals for exercise and use exercise as a form of self-punishment. They also reported spending significantly more time and money on worrying about and managing their appearance, and body image concerns had a more negative impact on their private, social and professional lives.* ***Conclusions:*** *Body image concerns and driven exercise are common among women, but women with a history of eating disorders invest more time in them and report more negative consequences.*

KEYWORDS: EATING DISORDERS, BODY IMAGE CONCERNS, DRIVEN EXERCISE, TWIN STUDIES

INTRODUCTION AND AIMS

Eating disorders (EDs) are common and persistent mental disorders among young women: 6–18% of Finnish women suffer from EDs at some point in their life (1). Previous studies have found that body image concerns play a significant role in the development and maintenance of EDs (2-4).

Body image is a multidimensional construct that consists of perceptual, evaluative and behavioural components (5,6). Negative body image, particularly body dissatisfaction, is a common risk factor of eating disorders (7). On the other hand, positive body image appears to be a protective factor from disordered eating (8).

Physical activity has emerged as a powerful potential mediator of positive body image (9). However, an intense focus on exercise and appearance can also have negative consequences (10).

A more recent turn in body image research has been to study appearance investment (11). Appearance investment can boost quality of life (8) but can also turn dysfunctional if it results in social anxiety and lower quality of life, or causes excessive self-consciousness, such as intense body surveillance (5).

Physical appearance can also be seen as a form of capital that can be accumulated and exchanged socially and economically (12). Recent studies have also shown that physical appearance as capital involves double standards for women: accumulating it is generally endorsed but exploiting it is generally frowned upon (12). In general, younger women are more likely than men to place importance on their appearance and invest time to achieve their ideal appearance (13).

Although appearance investment can be measured using various approaches (11,14,15), we feel that body image-related behaviours and cognitions are not yet fully described. Body image concerns affect everyone to some degree, yet relatively few studies have sought to study appearance-oriented cognitions and behaviours in the community.

Using a community-based setting, the aim of our study was to compare body image concerns and exercise in women with and without a diagnosis of lifetime eating disorder. We also sought to quantify time and money invested in appearance-

related activities and their impact on the women's private, social and professional lives. Our hypothesis was that women with eating disorders (EDs) would have a higher need to alter their appearance, spend more time and money in appearance management activities and experience feelings of worry more often than women without EDs.

METHOD

STUDY PARTICIPANTS

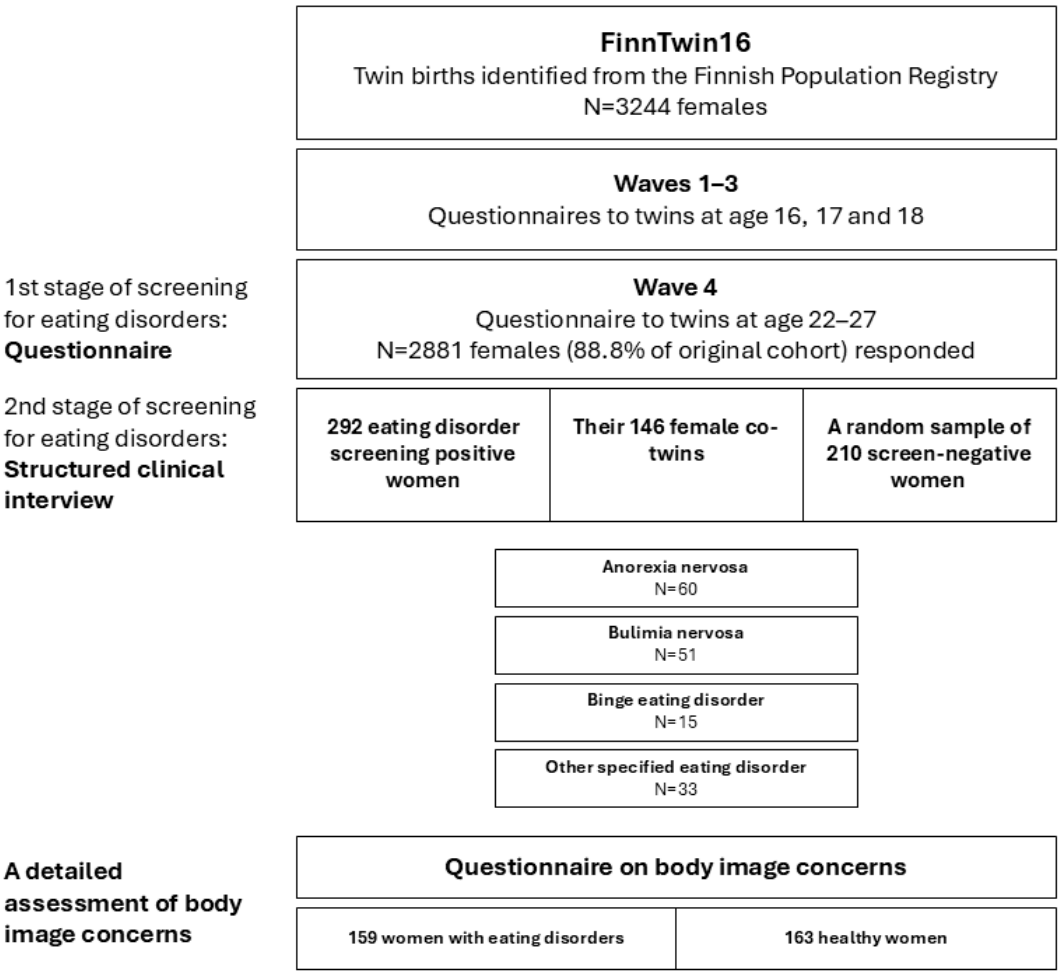
This study is a cross-sectional case-control study involving women with eating disorders (n=159) and randomly selected women without eating disorders (n=163) from a community-based cohort. The participants are from FinnTwin16 (16), a nationwide cohort study of Finnish twins born between 1974 and 1979 (n=5563).

The flowchart of the study design is presented in *Figure 1.* The data collection took place in 2000–2003 when the participants were 22–28 years old (mean 24.4, standard deviation (SD) 0.94), their eating disorder symptoms were assessed using three subscales of Eating Disorder Inventory-2 (EDI) (17), including Body Dissatisfaction (BD), Drive for Thinness (DT) and Bulimia, along with several other questions (self-reported weight and height, self-reported anorexia nervosa, self-reported bulimia nervosa, purging, eating disorder suspected by others). Based on low body mass index (BMI), self-reported or suspected ED or high EDI scores, a subset of female participants were invited to take part in detailed diagnostic interviews using the Structured Clinical Interview for DSM-IV (SCID) (18) that included diagnostic modules for anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED) and other specified feeding and eating disorder (OSFED) (19). All diagnoses were recoded following DSM-5 diagnostic descriptions (20).

After the interview, the participants were given a self-report questionnaire that assessed body image concerns in greater detail. The participants of the present study completed the ED screening questionnaire, participated in the diagnostic telephone interview and returned the body image concern assessment questionnaire. Of these respondents, 163 women did not have an eating disorder and 159 women (Women with EDs) had a lifetime diagnosis of an eating disorder. Of women with EDs, 37.7% had AN (n=60), 32.1% had BN (n=51), 9.4% had BED (n=15) and 20.8% had OSFED (n=33). The inclusion of men in this study was also considered. However, because very few men screened positive for eating disorders, their inclusion in more detailed statistical analyses of body image concerns was not feasible because of low numbers. The key characteristics of male participation have been described in previous studies (21).

Participation in the present study was voluntary; all participants gave their informed consent prior to their inclusion in the study. The study followed principles expressed in the Declaration of Helsinki.

Figure 1: Flowchart of study waves and participants about here.



BODY IMAGE CONCERNS

Body image concerns (appearance-oriented cognitions and behaviours) were measured by a survey designed specifically for this study. The complete list of items is available in the supplement (Appendix A). The assessment included 66 questions regarding appearance, lifestyle, eating habits and mood. In this brief report, we focus on 20 items that measured appearance-oriented cognitions and behaviours, including exercise, and their impact on the participants' personal and social life, studies or work. Of these items, one was worded ambiguously, thus we left it out from data analysis.

These items assessed, for example, time spent on body image concerns, the time and money spent on appearance management, the frequency of exercise and the use of diet supplements and slimming beauty products (Appendix A). The impact of body image concerns on various aspects of life was assessed by evaluating how often these concerns caused sadness, diminished sex life and impacted on social relationships, studies or work (Appendix A). The participants also reported how frequently they exercised, how often they exercised when ill or injured and whether they used exercise as self-punishment (Appendix A).

STATISTICAL ANALYSIS

We computed descriptive statistics from survey responses and analysed how women with EDs and the comparison group differed in terms of appearance-oriented behaviours and cognitions using cross-tabulation with Pearson's chi-squared test. We collapsed the last two categories of the 4-level items into one, because the frequency rates in the fourth option were rather rare, especially among the comparison group. Categorical variables measuring time were recoded into binary

variables: less than 30 minutes and at least 30 minutes. We also accounted for clustered sampling within twin pairs and adjusted P-values by design-based F (22). We performed all statistical analysis using Stata 16.0.

RESULTS

DEMOGRAPHICS

Both the women with and without EDs were similar in terms of age, education and self-rated income (*Table 1*). However, women with EDs differed significantly from the comparison group in their BMI and Eating Disorder Inventory-2 (EDI) subscale scores (*Table 1*). Women with EDs were also more likely to be currently enrolled at university than the women in the comparison group (*Table 1*).

Table 1. Demographic and social characteristics of study participants.

Variables	Women with EDs †			Women without EDs †			P-value ‡
	N	mean	SD	*N*	mean	SD	
Age, years	159	24.32	0.85	163	24.38	0.80	0.536
Body mass index	159	22.47	3.84	162	21.04	3.13	<0.001
EDI-bulimia	158	17.83	7.36	159	11.27	4.16	<0.001
EDI-Body dissatisfaction	159	32.27	10.38	163	23.96	9.81	<0.001
EDI-Drive for thinness	158	26.61	9.20	161	17.73	7.89	<0.001
	N (%)			*N (%)*			
Completed education							0.659
12-year education	123 (77.36)			131 (80.86)			
Non-university higher education	25 (15.72)			22 (13.58)			
University degree	11 (6.92)			9 (5.56)			
Ongoing studies							0.094
No ongoing studies at university level	116 (72.96)			132 (81.48)			
Ongoing studies at university level	43 (27.04)			30 (18.52)			
Self-rated income							0.106
Very good	7 (4.43)			7 (4.32)			
Quite good	31 (19.62)			51 (31.48)			
Average	67 (42.41)			64 (39.51)			
Quite poor	41 (25.95)			35 (21.60)			
Very poor	12 (7.59)			5 (3.09)			

† Totals may vary because of missing value
‡ P-value from linear regression analysis for continuous variables $\chi 2$/design-based F for categorical variables. Adjusted for clustered sampling within the twin pair
Note: SD=Standard deviation, EDI=Eating Disorder Inventory

BODY IMAGE CONCERNS IN THE COMMUNITY

Table 2. Appearance-oriented cognitions and behaviours in the community.

Variables	ED+ (%)	ED–(%)	P-value †	OR	95% CI
Q10: Thinking about appearance at least 30 mins daily	35.9	16.0	<0.001	2.94	1.64–5.28
Q11: Worrying about appearance at least 30 mins daily	26.4	10.4	<0.001	3.08	1.59–5.97
Q12: Feeling anxious, sad or low because of appearance-related worries	81.8	44.8	<0.001	5.53	3.25–9.40
Q14: Enhancing appearance for at least 30 mins daily	45.9	33.1	0.021	1.71	1.08–2.71
Q15: Appearance-oriented spending (at least 50 € monthly)	27.7	16.0	0.012	2.02	1.16–3.50
Q16: Neglecting social life because of appearance-related matters	40.9	14.7	<0.001	4.00	2.29–6.99
Q17: Appearance-related worries have negatively impacted sex life	67.9	35.0	<0.001	3.94	2.45–6.32
Q18: Appearance-oriented cognitions have interfered with studies or work	39.0	12.9	<0.001	4.32	2.41–7.74
Q19: Appearance-oriented cognitions have impacted education or career choices	22.0	14.1	0.084	1.72	0.93–3.19
Q20: Avoiding other people because of appearance-related doubts, worries or shame	45.3	17.8	<0.001	3.82	2.24–6.53
Q21: Denying oneself things that one likes because of own appearance, dieting or exercising	78.0	46.6	<0.001	4.06	2.48–6.62
Q22: Using weight-loss products or devices	28.9	14.7	0.003	2.36	1.32–4.21
Q23: Appearance-oriented consuming of dietary supplements or high-protein foods	28.3	15.4	0.011	2.16	1.19–3.95
Q24: Having considered or sought cosmetic surgery	49.1	40.5	0.155	1.42	0.88–2.29
Q26: Exercising almost daily	15.7	7.4	0.025	2.35	1.10–5.02
Q27: Exercising at least 1–2 hours at a time	35.0	27.8	0.174	1.40	0.86–2.29
Q28: Exercising while injured	37.1	27.2	0.068	1.58	0.97–2.59
Q29: Exercise used as a form of self-punishment	59.1	15.5	<0.001	7.87	4.56–13.57
Q30: Setting goals for physical activity	49.7	28.4	<0.001	2.49	1.57–3.95

† P-value from design-based F for categorical variables. Adjusted for clustered sampling within the twin pair
Note: OR=Odds Ratio, CI=Confidence Interval

As described in *Table 1*, body image concerns were frequently reported by all participants. However, women with EDs reported engaging in these significantly more often and spending more time on worrying and managing their appearance. Body image concerns were more time consuming for women with EDs: 35.9% reported thinking about and 26.4% worrying about their appearance for at least half an hour every day, compared to 16.0% ($p<0.001$) and 10.4% ($p<0.001$) of women in the comparison group, respectively. On daily basis, 45.9% of women with EDs spent at least half an hour on appearance management activities (vs. 33.1% of the comparison group, $p=0.021$).

The use of appearance management products was also more common among women with EDs than in the comparison group: almost a third of them used nutritional supplements or high-protein products (28.3% vs. 15.4%, $p=0.011$), diet supplements or toning beauty products (28.9% vs. 14.7%, $p=0.003$) and spent at least 50€ (in early 2000 would equal approximately 74 € in 2025) on their appearance monthly (27.7% vs. 16.0%, $p=0.012$). Their intention to engage in cosmetic procedures, however, did not differ significantly ($p=0.063$).

PHYSICAL EXERCISE AND SELF-PUNISHING BEHAVIOURS

We also investigated the relationship between physical exercise and appearance concerns. Time devoted to workout sessions, or exercising when injured, did not significantly differ between women with and without EDs, but women with EDs were more likely to exercise almost daily (15.7% vs. 7.4%, $p=0.025$) and set goals for exercise (49.7% vs. 28.4%, $p<0.001$).

Women with EDs also engaged in self-punishing activities significantly more often than the comparison group: 78.0% (vs. 46.6% of the comparison group, $p<0.001$) denied themselves things they liked because of their appearance, dieting or exercising, and 59.1% (vs. 15.5% of the comparison group, $p<0.001$) used physical exercise as a form of self-punishment.

IMPACT ON PRIVATE, SEXUAL, SOCIAL AND PROFESSIONAL LIFE

Body image concerns were not only more common among women with EDs, but they also had more of a negative impact on their private, sexual, social and professional life. Compared to the women in the comparison group, women with EDs were almost two times more likely to report that body image concerns had caused appearance-related worries (81.8% vs. 44.8%, $p<0.001$) or impacted on their sex life (67.9% vs. 35.0%, $p<0.001$).

Withdrawing from social life because of insecurities regarding one's appearance was significantly more common among women with EDs than the women in the comparison group. Doubts, worry or shame caused 45.3% of women with EDs to avoid other people, and 40.9% neglected their social relationships because of appearance-related issues. Of the comparison group, 17.8% ($p<0.001$) and 14.7% ($p<0.001$) reported these issues, respectively.

Women with EDs were significantly more likely to report that body image concerns had interfered with their studies or work than the women in the comparison group (39.0% vs. 12.9%, $p<0.001$). However, body image concerns had not significantly impacted on most women's career choices.

Despite these findings, a relatively prominent proportion of women with EDs did not report a negative impact on the different aspects of their lives, as shown in *Table 1*. Most women of the comparison group were not affected by body image concerns.

DISCUSSION

In this case-control study nested in a population-based cohort, we examined body image concerns, exercise and their consequences on various aspects of life in women with and without eating disorders (EDs). We also sought to quantify time and money spent on appearance management activities. Overall, body image concerns, self-punishing behaviours and ensuing impairments in life were reported significantly more often by women with EDs than by the comparison group. Women with EDs were also more likely to express features of driven exercise.

SPENDING ON APPEARANCE

In our setting, body image concerns were more common and more time consuming among women with EDs compared to women without EDs. We were able to find three previous studies that documented time spent on appearance concerns. In the first of these two studies, Rudd and Lennon (23) examined the lived experiences of 95 college women in a qualitative setting: 11.6% of them had indicated anorexia-related and 7.4% bulimia-related behaviours. Their study participants reported spending 20 to 120 minutes to "get ready" on a daily basis, but the average time was not mentioned. Almost half of the women were satisfied with their body, whereas 15% were dissatisfied (23). It was not reported, however, if women who were dissatisfied with their appearances spent less, same or more time "getting ready" than women who were satisfied with their looks.

In the second study, Singlehurst et al. (24) studied the time-use patterns of 10 participants with binge eating disorder and the impact that the disorder had on their everyday activities. The average time spent on washing and dressing as personal care was 53 minutes. Other appearance management activities were not included in the time-use patterns. The third study we found, by St-Pierre et al. (25), compared the time-use patterns between anorexia nervosa, bulimia nervosa and binge eating disorder for a period of 24 hours. These patterns were categorized as personal care, productivity and leisure. Similar to Singlehurst et al. (24), the only appearance management activity recorded was washing and dressing. On average, participants with anorexia nervosa spent most time (39min), followed by participants with bulimia nervosa (31min) and binge eating disorder (26min), on washing and dressing (25).

Our results cannot be directly compared to these studies for three reasons. One, our questionnaire had fixed options to choose from, and no possibility to indicate the actual time. Two, we also measured attempts to enhance appearance, that goes beyond daily hygiene. Third, we didn't perform between-group analysis due to our modest sample size. Future studies should consider collecting detailed and consistent information about appearance management activities and other time-use patterns in EDs.

PHYSICAL ACTIVITY

To our surprise, we found no significant difference in the amount of exercising between women with and without EDs. After all, this is a common stereotype associated with EDs. There are many possibilities that could explain this, starting from our study setting, but we discuss the two that we find most likely.

On one hand, patients with anorexia nervosa significantly under-reported light physical activity, compared to moderate and vigorous physical activity, on self-reporting questionnaires when compared to accelerometer data (26). Bezzina et al. (26) suggest that patients with anorexia nervosa might define "light activity" differently than other groups in their study.

On the other hand, physical activity as a symptom in EDs can be defined either in terms of quantitative dimension (excessive) or qualitative dimension (compulsive). Instead of looking at the quantity of exercise, the qualitative dimension has been found to be more fitting to describe the exercise in eating disorders (27). Rigid routine, neglecting other activities for physical activity and feeling guilty when skipping a workout session attribute to compulsivity (28).

These two could explain, at least partially, why our finding about the amount of physical activity was different from previous studies. Firstly, patients with anorexia nervosa underestimate light physical activity, and since almost 2/5 of the women with EDs in our setting had anorexia nervosa, this could affect the results for the whole group. Because of the modest sample size, we are not able to do between-group analysis without losing power. Secondly, compulsivity also speaks for our findings. After all, in our setting, women with EDs reported setting goals for exercise and using it for self-punishment more often than the comparison group. We would speculate that women with a history of restrictive anorexia nervosa would engage more often in driven exercise than, for example, women with a history of binge eating disorder.

IMPAIRMENTS IN LIFE

Body image concerns were associated with impairment in several important areas of life, including social and occupational life and sexual and romantic relationships. These results are in line with previous research. Women with EDs reported relatively ascetic lifestyles and engaged in behaviours such as self-denial and self-punishment. These kinds of behaviours are seen in ascetic personality trait that is part of overcontrol in EDs, affecting both adults and adolescents (see, for example, 29,30). Previous studies have found that ascetic trait in EDs might negatively affect treatment outcomes (31) and make it harder to receive care (30). The ascetic lifestyle may have an impact on overall quality of life. In our study, negative body image and impairment in different aspects of life were more common among women with EDs than in the comparison group.

In general, negative body image is associated with lower quality of life (32) and poorer social functioning (33). Disordered eating is associated with lower psychological quality of life, whereas positive aspects of body image are associated with enhanced quality of life (8). In past studies, severity of ED symptoms, along with anxiety and depression, has predicted impairment in social and occupational functioning (34,35). Stigmatization related to EDs may increase feelings of alienation and social withdrawal, which, in turn, may further increase ED symptom severity (36). Even after recovery, individuals with EDs report more difficulties in social and occupational functioning compared to individuals without an eating disorder (35). Previous studies also suggest that both body size and body image impact on romantic relationships (33). Moreover, women with negative body image experience greater dissatisfaction with their sex lives, relationships and dating situation (33).

Studies about social comparison and body image have found that women are more prone to be concerned about how other people evaluate their bodies than men, and that these concerns

can lead to avoiding social encounters and spending more time alone (33). Rudd and Lennon (23) suggest that social comparison is at the core of endless appearance management behaviour. These theories could also help explain why the women with EDs in our study were more likely to experience more negative impact on various aspects of their lives, and of spending more time on their appearance-oriented cognitions and behaviours than women in the comparison group. From 1998 to 2018 there has been a decreased trend in body dissatisfaction and dieting in Finland (37). Despite these positive developments in body image over the past two decades, body image concerns are still associated with a considerable burden, particularly in women (37).

Our findings reflect the Sarpila et al. (12) theory about "aesthetic capital": Moderate investment on accumulating aesthetic capital was common and widely endorsed by women in our study. In our study, both women with and without eating disorders generally engaged in appearance management, but women with EDs were more involved and less likely to report benefits or positive consequences.

STRENGTHS AND LIMITATIONS

The unique strength of this nested case-control study was the inclusion of women without EDs. The population-based control group of women provides some insight into the distribution of body image concerns in participants' lives. Women without EDs also frequently engaged in these behaviours. Although body image concerns impact on most women, women with EDs were far more likely to be involved in excessive appearance management behaviour, overcontrol and self-punishment.

Our study has limitations that should be considered when interpreting the results. First, our sample included only women and our sample size was modest, which is reflected in the precision of estimates. Because of low number of participants, this study was not designed to address the impact of eating disorder treatment on appearance-oriented cognitions and behaviours. Women with eating disorders in our study included women at different stages of recovery. For this reason, differences in clinical populations could be even more extreme. Second, we used an ad hoc questionnaire to measure body image concerns (appearance-oriented cognitions and behaviours). At the time of design of this study, widely used measures of appearance investment, like Appearance Schemas Inventory (ASI-R) (5), were not yet available in our context. For this reason, our results cannot be directly compared with other studies. Third, our questions on appearance investment were based on just one wave of a longitudinal study, and therefore the study was cross-sectional. For this reason, our data cannot be used to resolve causal questions.

CONCLUSION

Many women with eating disorders examine, monitor and evaluate their bodies trying to change how they look and feel. However, as appearance-related pressure impacts on all women, these thoughts and behaviours are not limited to people with eating disorders. Women with and without eating disorders reported frequent body image concerns (appearance-oriented cognitions and behaviours). However, women with eating disorders were far more likely to engage in these thoughts and behaviours and spend more time and money on them. Women with eating disorders were also more likely to report that these behaviours had a negative impact on their private, sexual, social and professional lives, and to engage in driven exercise and self-punishing behaviour.

Supplementary Material

Supplementary data are available at Psychiatria Fennica online.

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