

1 **The Role of Body-esteem in Academic Functioning Problems Associated with Eating Disturbances**

2 **Abstract**

3 **Objective:** To explore the role of body-esteem and self-esteem in the occurrence of academic functioning problems  
4 associated with eating disturbances. **Participants:** 330 university students (aged 16–53 years) in Finland in 2016.

5 **Method:** Interference with academic functioning measured with the Eating and Body Image Academic Interference  
6 Scale. Multivariable logistic regression analyses were performed to describe the relationship of body-esteem, global  
7 self-esteem, and age with academic functioning problems associated with eating disturbances. **Results:** The level of

8 academic functioning problems was low. High appearance-esteem (OR = 0.26; 95% CI [0.14–0.48]) and a five-year  
9 increase in age (OR = 0.68; 95% CI [0.52–0.89]) provided protection against academic functioning problems, whereas

10 high evaluations attributed to others about one’s body and appearance increased the odds of such problems (OR = 2.25;  
11 95% CI [1.41–3.59]). **Conclusion:** Problems in academic functioning may relate to problems in eating behavior, body  
12 image, and feelings about appearance.

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14 **Keywords**

15 Academic functioning; Body-esteem; Body image disturbance; Eating disturbance; Student

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## 29 **Introduction**

30 Eating disorders are among the most challenging mental illnesses among young adults.<sup>1</sup> They afflict millions of people,  
31 irrespective of age, gender, or nationality. Even more common are sub-threshold eating pathologies, which are  
32 detrimental to mental<sup>2</sup> and physical health, social functioning,<sup>3</sup> and quality of life.<sup>4</sup> The burden of eating disorders is  
33 most evident in young adulthood,<sup>5</sup> often during the years of academic studies. Already in childhood and adolescence,  
34 unhealthy dietary habits can have negative impacts on school performance.<sup>6,7</sup> Previous studies have observed an  
35 association between disordered eating and poor academic performance.<sup>8,9</sup> However, those who are diagnosed with an  
36 eating disorder and treated with a combination of psychotherapy and medication have higher grade-point-averages than  
37 those without eating disorders.<sup>10</sup> Still, little is known about the problems in academic functioning (PAF) associated  
38 specifically with eating disturbances.

39 To date, two cross-sectional studies conducted in the US have provided evidence of PAF<sup>11,12</sup> by showing that students  
40 with higher levels of bulimic symptoms, a drive for thinness, body dissatisfaction,<sup>11</sup> an appearance concern, less  
41 satisfaction with specific body areas, a greater preoccupation with weight, and a heavier weight status<sup>12</sup> experience PAF  
42 more than others. Being preoccupied with weight, in particular, is suggested to have a strong effect on PAF.<sup>12</sup> These  
43 findings are preliminary, however, and thus, the researchers call for future studies to expand observations on other  
44 factors, e.g., self-esteem and perfectionism, which have been found to be connected to eating disorders.<sup>13</sup>

45 In the literature, self-esteem is often considered a risk factor for the development of eating disorders.<sup>14</sup> Prospective  
46 studies suggest that high self-esteem provides protection against unhealthy weight control behaviors,<sup>15</sup> binge eating,<sup>16</sup>  
47 and purging behaviors.<sup>17</sup> In addition, higher self-esteem predicts the cessation of unhealthy weight control behaviors<sup>15</sup>  
48 and binge eating.<sup>18</sup> In contrast, the more one's weight or shape determines one's feelings about oneself, the more likely  
49 one is to adopt unhealthy weight control behaviors.<sup>15</sup> However, not all findings have been consistent.<sup>19</sup> Furthermore, the  
50 studies have focused on global self-esteem instead of body-esteem, whereas the latter could better reflect the issues  
51 important for those struggling with eating pathology. In this study, we explore the possible role of body-esteem and  
52 self-esteem in the occurrence of PAF among university students.

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## 54 **Methods**

55 This study is part of a large concerted research effort, European Cooperation in Science and Technology (COST)  
56 Action IS1210.<sup>20</sup> The study was conducted as a cross-sectional survey using self-report questionnaires.

57 Participants were recruited via weekly university emails, the student union and its sub-organizations, and the intranet  
58 for students (information channel intended for all students) between October 19 and December 7 in 2016. There were  
59 approximately 16 000 students studying at the university at that time. The student union of the university and its sub-  
60 organizations together reach approximately 5 000 students, and the intranet for students is available for all students at  
61 the university (total sample). The data were collected using an online survey tool (Webropol). Information about the  
62 study and an informed consent form were integrated into the survey. Altogether, two reminder emails were sent five and  
63 six weeks from the beginning of the data collection via weekly university emails and the student union and its mailing  
64 lists to sub-organizations. Ethical approval was obtained from The Ethics Committee of the university. The sample  
65 consisted of 330 students attending one university in Finland in 2016. The age of the participants ranged from 16 to 53  
66 years (MD = 24 years). Altogether, 83% (n = 275) of the students were females.

### 67 *Measures*

68 PAF were measured with the Eating and Body Image Academic Interference Scale (EBIDAIS),<sup>12</sup> a 12-item questionnaire  
69 designed to assess the degree to which symptoms of eating problems and body dissatisfaction interfere with class  
70 attendance, paying attention in class, and homework completion. For translating the scale into Finnish, the TRAPD  
71 translation process was used in the present study (Translation, Review, Adjudication, Pre-testing and Documentation<sup>21</sup>).  
72 The items are rated on a 5-point Likert scale, ranging from “never” to “always” with scores of 1–5. The summed scores  
73 range from 12 to 60, with higher scores indicating an increasing severity of PAF. The internal consistency of EBIDAIS  
74 has been high (Cronbach’s alpha 0.92) among university students.<sup>12</sup> In this study, the Cronbach’s alpha was 0.75. For the  
75 analyses, EBIDAIS was categorized into two intervals on the basis of median: “low PAF” < 17.5 points and “high PAF”  
76  $\geq 17.5$  points.

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78 Various aspects of body-esteem were assessed with the official Finnish back-translation of the Body-Esteem Scale for  
79 Adolescents and Adults (BESAA),<sup>22</sup> a 23-item self-report questionnaire developed to measure adolescents’ and adults’  
80 attitudes and feelings about their own bodies and appearance. The items are responded to using a 5-point Likert scale  
81 scored from 0 (“never”) to 4 (“always”), where higher points indicate better body-esteem. BESAA consists of three  
82 subscales: general feelings about appearance (BE-Appearance), others’ evaluations of one’s body and appearance (BE-  
83 Attribution), and weight satisfaction (BE-Weight). The internal consistency of the subscales has varied between 0.91–  
84 0.93, 0.74–0.85, and 0.94–0.95, respectively among young adults.<sup>22</sup> In this study, the Cronbach’s alphas were 0.93,  
85 0.77, and 0.94, respectively.

86 Global self-esteem was measured with the Finnish translation of the Rosenberg Self-Esteem Scale (RSES),<sup>23,24</sup> a 10-  
87 item questionnaire designed to assess the feelings of global self-worth on a 4-point Likert scale ranging from “strongly  
88 disagree” to “strongly agree” with scores 1–4. The summed scores range between 10 and 40, with higher scores  
89 indicating higher self-esteem.<sup>23</sup> The internal consistency of RSES has varied between 0.89 and 0.93 among young  
90 adults.<sup>25</sup> In this sample of students, the Cronbach’s alpha was 0.93.

#### 91 *Data analyses*

92 Logistic regression analyses were performed to investigate the associations between the dichotomous outcome variable  
93 and the explanatory variables. Models were fitted in two steps. First, the factors of body-esteem, self-esteem and age  
94 were modeled separately. At this stage, the explanatory variables consisted of gender and each of the body-esteem  
95 factors, or self-esteem, or age, and an interaction term between gender and body-esteem, or self-esteem, or age.  
96 Secondly, as none of the interactions were significant (all  $p$ -values  $> .05$ ), the final model was based on the gender-  
97 combined data. However, as the occurrence of PAF was higher ( $p < .001$ ) in females (MD = 18; Q1; Q3 [15; 21]) than  
98 males (MD = 16; Q1; Q3 [14; 19]), the analysis was adjusted for gender. However, we also conducted an additional  
99 analysis with a subsample of females only. Because the participants in our data represented a non-traditional college age  
100 group (16–53 years), we also conducted an analysis with a subsample consisting of young adults only (18–29 years).  
101 Associations were quantified with odds ratios (ORs) with 95% confidence intervals (95% CI). Multicollinearity  
102 between the predictors was assessed with collinearity statistics (VIF, tolerance, and condition index), which supported  
103 the assumption of no multicollinearity. The statistical computations were performed with SAS system for Windows,  
104 release 9.4.  $P$ -values  $< .05$  were interpreted as statistically significant. Cronbachs’ alphas were assumed to be  
105 acceptable if they ranged between .70<sup>26</sup> and .95.<sup>27</sup> Acceptable Cronbachs’ alphas were observed in all of our scales.

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#### 107 **Results**

108 The average EBIDAIS score was relatively low (MD = 17.5), indicating a low level of PAF among university students.  
109 The general feeling about appearance was slightly positive (MD = 2.4). Evaluations attributed to others about one’s  
110 body and appearance as well as weight satisfaction were somewhat lower (MD = 2.0 and 2.1). The average level of  
111 global self-esteem was moderate (MD = 21). (see Table 1.)

112 The multivariable logistic regression analysis revealed an independent association of general feelings about appearance,  
113 evaluations attributed to others about one’s body and appearance, and age with PAF (see Table 2). A one-point increase

114 in BE-Appearance decreased the odds of a student having PAF by 74% when BE-Attribution, BE-Weight, RSES, age,  
115 and gender were taken into account. In addition, the odds of PAF decreased by 7% with every one-year increase in age  
116 and by 32% (OR = 0.68; 95% CI [0.52–0.89]) with every five-year increase in age when other factors in the model were  
117 controlled for. In contrast, a one-point increase in BE-Attribution increased the odds of a student having PAF by 125%  
118 when adjusting for other factors. When we conducted new analyses with only females in the sample, no significant  
119 changes in the results were observed (data not shown). The analysis on the subsample of young adults (aged 18 to 29  
120 years) revealed that general feelings about appearance (BE-Appearance) and others' evaluations about one's body and  
121 appearance (BE-Attribution) remained associated with PAF, whereas the association between age and PAF diminished  
122 to nonsignificant (data not shown). Weight satisfaction and global self-esteem did not have an independent association  
123 with PAF in any of our analyses.

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#### 125 **Comment**

126 In this study, we described the correlates of academic functioning problems associated with eating disturbances. Our  
127 findings suggest that PAF are relatively uncommon among university students in Finland (MD = 17.5), which is similar  
128 to the situation observed in the US in a previous investigation (mean = 17.4).<sup>12</sup> We found that two dimensions of body-  
129 esteem, but not self-esteem, were independently associated with PAF. Firstly, students whose general feelings about  
130 appearance were high were better protected against PAF than others. This result is consistent with previous findings of  
131 the co-occurrence of negative appearance evaluation with PAF,<sup>12</sup> as well as the co-occurrence of appearance  
132 dissatisfaction<sup>28</sup> and body dissatisfaction<sup>15,18</sup> with eating pathology. Due to the cross-sectional design of the study, it is  
133 not possible to say whether high appearance-esteem resulted in fewer problems in academic studies or whether students  
134 facing fewer problems in their studies were more satisfied with appearance.

135 Secondly, individuals who formed their opinion about themselves based on their assumption of how they look to others  
136 were more likely to report PAF. A previous study found a positive but nonsignificant association between the level of  
137 appearance orientation and PAF.<sup>12</sup> In theory, individuals who are preoccupied with physical appearance adopt an  
138 observer's perspective of themselves. This 'self-objectification' together with the idea that appearance is a matter of the  
139 individual's own choice may provoke eating disturbances,<sup>29</sup> which, in turn, may result in problems in academic  
140 functioning. Conversely, the finding may also indicate that students who have problems in academic studies try to  
141 compensate for the feeling of failure by placing more importance on appearance and use disordered eating behaviors to  
142 enhance attractiveness. Differences in the findings between the US and Finland may partly be due to the difference in

143 the monetary burden of studies. In contrast to the US, university studies are free in Finland. Thus, it may be that the  
144 threshold for absenteeism and dereliction of studies is lower in Finland than in the US.

145 The third dimension of body-esteem, i.e., weight satisfaction, was not associated with PAF. This contradicts the  
146 previous findings,<sup>12</sup> where overweight preoccupation was found to have the greatest effect on PAF. Discrepancy in  
147 these results may be due to differences in the measures. In Yanover's and Thompson's study,<sup>12</sup> the concept of  
148 overweight preoccupation included dieting and eating restraints in addition to weight vigilance and fat anxiety. Thus, it  
149 reflects a wider conceptual construct than the subscale of weight satisfaction used in this study.

150 In related literature, the findings of the role of self-esteem in the development of eating pathology are not consistent.<sup>14</sup>  
151 In this study, the association between global self-esteem and PAF was nonsignificant, suggesting that the role of body-  
152 esteem in the occurrence of PAF is more important than feelings of global self-worth. Thus, it may be that low body-  
153 esteem, rather than low global self-esteem, is a risk for eating pathology.

154 Finally, the occurrence of PAF was found to decrease with age. This is in line with the finding that individuals are most  
155 vulnerable to eating disturbances in youth<sup>14</sup> and support the hypothesis stated by Baars et al.<sup>30</sup>, that a person who is  
156 older may have acquired additional important skills because of being challenged in more years of experience.

### 157 *Limitations*

158 Some limitations of the study must be acknowledged. The participants were recruited from one university using non-  
159 random sampling, and the data were based on individuals' self-reports, which related to weight, offering robust  
160 evidence of social desirability bias.<sup>31</sup> Many people with an eating disorder say that they would not be truthful when  
161 answering questions about eating problems.<sup>32</sup>

162 Although we cannot calculate an accurate response rate for our study, we can assume that it is quite low, because there  
163 were approximately 16 000 students at the university at the time of the collection. From these students, only 330  
164 answered our questionnaire, although we used reminders to increase response rate. This, unfortunately, affects the  
165 generalizability of our study. Disordered eating was not measured separately from academic functioning.

166 Although the confounding effect of gender was taken into account in the analysis, we cannot rule out the possibility of  
167 the confounding effect of some other factor(s) not measured in this study. Previously, the internal consistency of  
168 EBIDAIS has been high (Cronbach's alpha 0.92) among university students.<sup>12</sup> However, in this study, the Cronbach's  
169 alpha was 0.75, which may indicate that the official back-translation is preferable to the TRAPD translation. Additional

170 limitations with this age group include older adolescents and young adults leaving home, establishing new social  
171 networks, working to obtain financial independence and experiencing physical, psychological, and social changes.<sup>30</sup>  
172 Moreover, the data was collected in a large concerted research effort in 2016 before the #MeToo and related  
173 movements. The #MeToo movement, which is a movement against sexual assault and abuse, could affect our results if  
174 the study was conducted today. Studies show that sexual assault or abuse often precedes disordered eating, which is  
175 used as a coping mechanism.<sup>33</sup> However, the evidence regarding the topic is lacking, and according to O'Neil et al.,<sup>34</sup>  
176 generations become more accustomed to the expansion of gendered roles.

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### 178 *Implications for college health professionals*

179 The results from the current study suggest possible avenues for college health professionals to identify potential  
180 problematic eating behaviors and low body-esteem among those students who have problems in their academic studies.  
181 These issues could be addressed, for example, by adopting general courses for young adults in college that focus on  
182 health and positive body image. Allowing a multidisciplinary approach (e.g., health educators and dietitians), courses  
183 on these topics could improve body-esteem and reduce dieting behaviors,<sup>35</sup> and thus provide a preventive effort for  
184 problematic eating behaviors and associated factors. Additionally, these general preventive interventions could provide  
185 a platform for detecting students with eating disorder pathology and PAF.<sup>36</sup> More specific approaches by psychologists  
186 and health care workers, for instance, could be taken to assure a low threshold for seeking help for those identified with  
187 problematic eating behaviors already causing PAF. Based on a meta-analysis by Melioli et al.<sup>37</sup> and Linardon et al.,<sup>38</sup>  
188 internet-based programs and third-wave behavioral interventions could provide here an effective way to help students of  
189 both traditional and non-traditional age groups.

190 Taken together, due to the limited number of and partly conflicting findings concerning PAF and their associated  
191 factors, more research on the topic is warranted. As social and cultural factors may impact PAF, studies addressing the  
192 issue in different countries would be needed. In conclusion, professionals in health care and education alike should  
193 remain aware that problems in academic studies may reflect problems in eating behaviors as well as body-esteem.

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