

Perfectionism and Eating Disorder Tendencies In Calorie-Tracking App Users

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Abstract. While diet and calorie-counting mobile applications can support users in achieving their goals, studies have also highlighted their potential negative impact on eating disorder tendencies. This study examines perfectionism as a possible contributing factor to such tendencies among users of calorie-counting apps. Data were collected over 21 days through voluntary participation, yielding a sample of 83 individuals aged 18–39. Participants completed online self-report questionnaires, including the Indonesian Multidimensional Perfectionism Scale (IMPS) and the Eating Attitudes Test (EAT-26). Results from simple linear regression analysis indicated that higher levels of perfectionism were strongly associated with an increased likelihood of engaging in behaviours linked to eating disorders ($\beta = 0.62, p < .001$), with perfectionism emerging as a substantial predictor of these behaviours ($R^2 = 0.38$). These findings underscore the need for further research on the psychological impact of calorie-tracking apps and suggest the importance of incorporating design strategies that promote healthier user experiences.

Keywords: calorie-counting; disordered eating behaviors; eating disorder; perfectionism; tendencies

Concerns about body weight management are increasingly common. Bailey et al. (2021) found that 45% of the general population actively attempts to lose weight. In Indonesia, similar patterns have been observed, with 57% of survey respondents reported engaging in some form of dieting (Populix, 2022). While adopting a healthy diet and staying physically active can support weight management, these efforts are not always implemented safely. Some individuals adopt more extreme or restrictive methods, such as skipping meals, eliminating certain food groups, or obsessively tracking calories. These behaviors can lead to harmful physical and psychological consequences, particularly when driven by unrealistic body ideals or emotional distress.

These patterns may develop into eating disorders, which are clinically diagnosed mental health conditions characterized by persistent disturbances in eating behavior and body image that impair functioning (American Psychiatric Association, 2013). Common behaviors include severe food restriction, binge eating, excessive exercise, or purging behaviors through laxative misuse or vomiting.

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However, many individuals engage in similar behaviors without meeting the full clinical criteria for an eating disorder diagnosis. These are referred to as eating disorder tendencies or disordered eating (Graziano & Sikorski, 2014; Hamamoto et al., 2020). Though subclinical, these patterns are maladaptive and linked to emotional distress, low self-worth, and negative body image. They are also significant because they can escalate into clinically diagnosable eating disorders (Hamamoto et al., 2020).

Eating disorder tendencies span all demographics, affecting people of all ages, in both clinical and general populations, across developed and developing countries (Mitchison et al., 2012). While both men and women are susceptible, women are more likely to experience weight dissatisfaction and engage in weight control measures (Forrester-Knauss & Stutz, 2012). The prevalence of eating disorder risk is global, with Indonesia reporting a rate of 7.4% (Pengpid & Peltzer, 2018). Contributing factors include low self-esteem, dysphoria, control issues, negative body image, and perfectionism (Oltmanns & Emery, 2019).

Recently, mobile health applications, particularly calorie-tracking apps, have become popular tools for weight control and fitness. These apps allow users to log calorie intake and estimate calories burned during physical activity. Features such as behavior tracking, goal setting, social connectivity, feedback, rewards, reminders, and streaks encourage consistent use (Eikey, 2021). Popular examples include MyFitnessPal, Lose It!, FatSecret, and Cronometer.

While diet apps can be effective, they may also trigger or worsen unhealthy eating behaviors. Users often report obsessive calorie tracking, heightened eating disorder symptoms, and increased psychosocial issues compared to non-users. Reported symptoms include preoccupation with body weight and shape, dichotomous thinking, binge eating, and dietary restraint (Linardon & Messer, 2019). According to Eikey (2021), these effects stem from the apps' emphasis on quantification, reinforcement of excessive use, and feedback mechanisms.

Many diet apps emphasize weight loss, promoting calorie restriction and exercise as primary goals (Honary et al., 2019). This encourages users to monitor calories consumed and burned, fostering a fixation on quantifying food intake, exercise, and body weight. Such fixation may lead to obsessive behaviors, distress, and guilt when goals are unmet, prompting compensatory behaviors (Honary et al., 2019). Additionally, self-worth may become tied to weight-related metrics, increasing the tendencies to over-assess body weight and shape (Levinson et al., 2017).

The structure of these apps can also contribute to negative outcomes. The apps are designed to boost user engagement through reminders, goal setting, positive reinforcement, leaderboards, and gamification features like streaks and trophies (Eikey, 2021; Honary et al., 2019). Although these elements encourage consistency, they may also lead to obsessive tracking and app dependency. Once logging becomes habitual, stopping can be challenging due to a perceived need for control over food and body (Eikey, 2021). This desire for control is associated with eating disorders, where it often serves as an attempt to regain control over aspects of one's life (Oltmanns & Emery, 2019).

The apps may also unintentionally reinforce unhealthy behaviors through their feedback systems. Rewards like praises, badges, and green indicators reinforce goal adherence, while missed targets prompt reminders, revoked rewards, or red indicators (Eikey, 2021). This can create a cycle

where users feel accomplished when meeting goals but experience distress when they don't (Honary et al., 2019). Even well-intentioned warnings can backfire. For example, a warning about under-eating may be misinterpreted as confirmation that the user is successfully controlling their intake, reinforcing further restriction.

With their goal-oriented nature and emphasis on precision, these apps align with traits of perfectionism (Simpson & Mazzeo, 2017). Their demands for consistent tracking also reinforces self-discipline, another perfectionism-related trait (Sirois, 2016). Perfectionism, characterized by unrealistically high standards and overly critical self-assessments, is a known risk and maintaining factor for eating disorder symptoms (Flett & Hewitt, 2002) as cited in Brown et al. (2012) and Fang and Liu (2022).

Hewitt et al. (1995) suggest that perfectionism contributes to eating disorders by fueling the pursuit of idealized body standards. Individuals impose perfectionistic expectations on eating and body control, using them for self-evaluation (Fairburn et al., 2003). They may fear falling short of these standards, which can trigger negative emotions when expectations are not met. This fear of failure can result in cycles of guilt and frustration, leading to compensatory behaviors such as overeating or avoidance, ultimately contributing to body dissatisfaction. The fixation on performance and perceived shortcomings reinforce constant monitoring of food intake, weight, and body shape, with self-criticism sustaining disordered behaviors (Fairburn et al., 2003). Perfectionism is also associated with rigid food preferences (Brown et al., 2012) and behaviors like binge eating, purging, and fasting (Forbush et al., 2007).

Hewitt and Flett (1991) defined perfectionism as comprising three dimensions. Self-oriented perfectionism (SOP) involves setting unrealistic standards for oneself and focusing on flaws with rigorous self-scrutiny, driven by the desire for success and fear of failure. Socially prescribed perfectionism (SPP) reflects the need to meet standards set by others, along with a desire to appear perfect, and fear of being evaluated negatively. In other-oriented perfectionism (OOP), the focus shifts to imposing unrealistic standards on others and stringently evaluating their performance.

Eating disorders are linked to self-oriented and socially prescribed perfectionism (Hewitt et al., 1995). Self-oriented perfectionism connects to dieting and preoccupation with thinness, while socially prescribed perfectionism relates more broadly to disordered eating, appearance concerns, and self-esteem. This suggests that perfectionistic tendencies in eating disorders may be driven both by internal standards and perceived external expectations. Other-oriented perfectionism, though not directly tied to eating behaviors, correlates with appearance and self-esteem measures.

In the context of calorie-counting apps, perfectionistic individuals may be especially vulnerable to rigid dietary practices, obsessive tracking, and experiencing anxiety or distress when deviating from often unrealistic goals. These apps provide highly structured numerical targets, such as calorie limits or exercise goals, that appeal to perfectionists' need for control and achievement. Their strong inclination toward self-regulation drives meticulous monitoring of food intake, physical activity, and body measurements. Moreover, the apps may encourage dichotomous thinking by suggesting exercise as a way to compensate for exceeding calorie limits, further reinforcing the all-or-nothing thinking

patterns common in perfectionism (Simpson & Mazzeo, 2017).

The growing prevalence of dieting raises concerns about unhealthy weight control behaviors and their potential link to eating disorder tendencies. The increasing use of calorie-counting apps highlights the need to examine how these tools may contribute to maladaptive eating patterns. While most research on perfectionism and eating disorders has focused on clinical populations, examining disordered eating tendencies in sub-clinical groups offers a broader understanding of problematic behaviors and identifies emerging risks. Additionally, little is known about how perfectionism operates among calorie-tracking app users, a group for whom the design features of these apps may reinforce perfectionistic tendencies. To address this gap, the present study explores the influence of perfectionism on eating disorder tendencies among calorie-counting app users and tests the hypothesis that perfectionism positively affects these tendencies.

Methods

Participants

The study received ethics clearance from the Faculty of Psychology, Universitas Gadjah Mada (1563/UN1/FPSi.1.3/SD/PT.01.04/2023). Participants were eligible if they had used calorie-tracking diet apps in the past six months and were at least 18 years old. No upper age limit was set, as dieting habits may occur at any age (Brandsma, 2007). Individuals with clinical eating disorders or medical conditions requiring special diets (e.g., diabetes, celiac disease) were excluded to minimize confounding factors, as some survey items addressed dietary practices like sugar avoidance, which is particularly relevant for diabetes. Data collection was limited to 21 days and relied on voluntary participation, which restricted the sample size but was sufficient for the planned regression analysis. The final sample consisted of 83 participants aged 18–39, including 74 females (89.2%), 8 males (9.6%), and 1 (1.2%) who preferred not to disclose their gender. Demographic details are presented in Table 1.

Table 1

Demographic Data

	Frequency	%
Age		
18-25	61	73.4%
26-29	16	19.2%
30-39	6	7.2%
Gender		
Female	74	89.2%
Male	8	9.6%
Prefer not to say	1	1.2%

The frequency distribution of app usage is outlined in Table 2. Most participants ($N = 34$, 41%) had been using the apps for more than 6 months, while others reported usage durations of 4–6 months ($N = 22$, 26.5%), 1–3 months ($N = 13$, 15.7%), and less than 1 month ($N = 14$, 16.9%). The most popular

apps were FatSecret ($N = 52$, 62.7%), followed by MyFitnessPal ($N = 22$, 26.5%) and Lose It! ($N = 13$, 15.7%).

Table 2

Frequency Distribution of App Usage

	Frequency	%
Duration of App Use		
Less than 1 month	14	16.9%
1-3 months	13	15.7%
4-6 months	22	26.5%
More than 6 months	34	41.0%
Types of Apps Used		
MyFitnessPal	22	26.5%
Lose It!	13	15.7%
Cronometer	1	1.2%
FatSecret	52	62.7%
Lifesum	2	2.4%
Fastic	1	1.2%
Fita	1	1.2%
Samsung Health	1	1.2%

Procedure

The study began with a literature review on disordered eating among calorie-counting app users, informing the research question and design. Measurement tools were adapted for the Indonesian population and first tested for psychometric validity. After refining the instruments, data were collected from a larger participant pool via Google Forms, shared on social media including WhatsApp, Line, X (formerly Twitter), and Instagram.

Instruments

Two self-report instruments were used: (1) the Indonesian adaptation of the Multidimensional Perfectionism Scale (IMPS) (Hewitt & Flett, 1991; Safitri & Preston, 2020) to assess perfectionism, and (2) a modified version of the Eating Attitudes Test (EAT-26) (Garner et al., 1982; Mandiri, 2015) to measure eating disorder tendencies.

Multidimensional Perfectionism Scale (IMPS) assesses self-oriented and socially prescribed perfectionism through self-report questions. The other-oriented subscale was excluded due to its limited relevance to eating behavior (Hewitt et al., 1995). Each dimension originally consisted of 15 items, totaling 30. Responses were on a six-point Likert scale from Strongly Disagree (1) to Strongly Agree (6), with higher summed scores indicating greater perfectionism. A trial with 23 participants yielded a Cronbach's alpha of 0.93 and item-rest correlations between 0.01 and 0.82. Following Kline (1986) guidelines, items with correlations below 0.25 were excluded, resulting in a final instrument with 26 items.

The modified Eating Attitudes Test (EAT-26) identifies tendencies related to unhealthy eating

behaviors across three subscales: dieting, bulimia and food preoccupation, and oral control. It contained 26 items rated on a six-point Likert scale from Always (3) to Never (0). Scores were summed, with higher totals indicating greater eating disorder tendencies. A trial with 23 participants produced a Cronbach's alpha of 0.914. Four items were removed: one due to zero variance and three with item-rest correlations below 0.25. The final instrument included 22 items.

Data Analysis

A simple linear regression analysis was conducted in Jamovi to examine the relationship between the independent variable (perfectionism) and the dependent variable (eating disorder tendencies). This analysis aimed to determine whether perfectionism positively affects eating disorder tendencies, and to quantify the strength and significance of this relationship.

Results

Descriptive statistics for the variables are displayed in Table 3. The mean score for perfectionism was 111 ($SD = 18.1$), while the mean score for eating disorder tendencies was 25.2 ($SD = 14.3$).

Table 3

Descriptive Statistics

	$X_{\min}$	$X_{\max}$	Mean	SD
Perfectionism	69	154	111	18.1
ED tendencies	0	61	25.2	14.3

Classical Assumption Test

A classical assumption test was conducted to determine whether the data met the requirements for further analysis. This included tests for normality and linearity. The Shapiro-Wilk test indicated that the data were normally distributed, with a significance level of 0.320 ($p > 0.05$). Linearity test was also performed to examine the linearity between the two variables. The test obtained a linearity significance value of .000 ($p < 0.05$), and the deviation from linearity was found to be not significant at .484 ($p > 0.05$), confirming a linear relationship between the variables.

Hypothesis Testing

A simple linear regression was conducted to examine the effect of perfectionism on eating disorder tendencies. The results showed a correlation coefficient (R) of .616, indicating a moderate effect size (≥ 0.5 and < 0.8) (Cohen, 1988). The standardized beta coefficient was $\beta = 0.62$, suggesting that higher levels of perfectionism were associated with greater eating disorder tendencies. The correlation of determination (R^2) was 0.38, indicating that perfectionism accounted for 38% of the variance in eating disorder tendencies. The overall model was statistically significant ($p < .001$). Detailed results are presented in 4 and 5.

Table 4*Linear Regression (Model Fit Measures)*

<i>R</i>	<i>R</i> ²	<i>F</i>	<i>df</i> 1	<i>df</i> 2	<i>p</i>
0.62	0.38	49.5	1	81	<.001

The regression equation is as follows:

$$Y = a + bX$$

$$Y = -28.97 + 0.49X$$

The intercept of the model is -28.97, which represents the predicted value of eating disorder tendencies (Y) when perfectionism (X) is equal to zero (i.e., where there is no perfectionism). The slope coefficient is 0.49, which indicates that for each one-unit increase in perfectionism (X), the predicted value of eating disorder tendencies (Y) increases by 0.49 on average.

Table 5*Model Coefficients for Eating Disorder Tendencies*

Predictor	<i>B</i>	SE <i>B</i>	<i>t</i>	<i>p</i>	β
Intercept	-28.97	7.79	-3.72	<.001	
Perfectionism	0.49	0.07	7.04	<.001	0.62

Overall, the linear regression analysis indicates a moderate and significant positive effect of perfectionism on eating disorder tendencies.

Discussion

This study examines the role of perfectionism toward eating disorder tendencies among users of calorie-counting mobile apps. Results from data analysis showed that perfectionism does positively influence eating disorder tendencies with moderate effect size, supporting the initial hypothesis. This suggests that individuals with higher levels of perfectionism are more likely to exhibit disordered eating behaviors. In addition, a correlation of determination (R^2) of 0.38 implies that perfectionism is responsible for explaining 38% of the variability in eating disorder tendencies. In other words, perfectionism is a significant predictor of disordered eating behaviors among calorie-counting app users.

The link between perfectionism and clinical eating disorders has been well established. The present findings extend this association by showing that perfectionism also functions as a risk factor in sub-clinical populations, such as those who engage in calorie-tracking. Although research specifically focused on perfectionism among calorie-conscious individuals is limited, our results are consistent with prior studies (Barnett & Sharp, 2016; Chang et al., 2008) that reported a positive correlation between perfectionism and disordered eating. Perfectionism is thought to contribute to these tendencies by imposing rigid standards on eating and body control in an effort to achieve

idealized appearance norms, whether self-imposed or socially prescribed (Fairburn et al., 2003; Hewitt et al., 1995).

While the current study did not explore specific motivations behind people's engagement in disordered eating behaviors, existing literature suggest they may arise from a desire to address feelings of body dissatisfaction and maintain a positive self-image. When individuals base self-worth on physical appearance, they may strive to conceal perceived flaws and conform to idealized standards (Hewitt et al., 1995). Perfectionism may further amplify these concerns by interacting with negative self-evaluations and low self-esteem (Barnett & Sharp, 2016; Oltmanns & Emery, 2019).

Another factor worth considering is gender. In this study, the majority of participants were women ($N=74$, 89.2%), with only 8 men (9.6%) and 1 participant (1.2%) preferring not to disclose gender. This aligns with previous studies which also observed a higher participation rate of women, such as those by Levinson et al. (2017) and by Honary et al. (2019). Gender has been recognized as an important factor in relation to weight dissatisfaction and disordered eating behaviors. For instance, as noted by Forrester-Knauss and Stutz (2012), although more men were overweight, women had a higher prevalence of dieting for weight loss. Moreover, even women of healthy weight have resorted to extreme weight loss strategies associated with disordered eating (Eikey & Reddy, 2017). Additionally, weight dissatisfaction and purging behaviors were more commonly observed among women, while binge eating and excessive exercise for weight control were similarly prevalent in both genders (Striegel-Moore et al., 2009). These findings might suggest that body dissatisfaction may be a driving factor for women's engagement with calorie-counting apps.

The findings also suggest that digital tools such as calorie-counting apps may interact with individual personality traits. In this context, the decision to engage in such apps could reflect heightened awareness of body image and health concerns, while the conscious effort exerted in diligently logging calorie intake and exercise reflects their drive and self-discipline in pursuing their goals. For individuals with perfectionistic tendencies, these features may reinforce rigid control over goal achievement and exacerbate feelings of guilt when goals are unmet.

The adverse effects of diet and fitness apps may, to some extent, stem from the apps' design itself. To address this, it is crucial to rethink the app designs and introduce features that encourage a balanced approach to fitness and a positive body image (Eikey, 2021). For example, instead of just focusing on calorie-counting, the apps should assist users in developing a healthy relationship with food and their bodies, and promoting healthy eating habits in various settings. They should also prioritize enjoyable exercise and emphasize its benefits for physical and mental health. Additionally, Eikey (2021) recommends reducing logging reminders and encouraging breaks to decrease users' dependency on the apps. Rather than engagement, the apps should promote more long-term behavior change (Honary et al., 2019). Furthermore, it is highly recommended to involve users and potential users in the app design process. For instance, past findings suggest that users prefer apps that passively record physical activities, as opposed to apps that require active logging of exercise or food intake data. By considering user feedback and incorporating features that align with users' needs, preferences, and experiences, app designers can effectively motivate healthy behaviors and create features that are both effective

and beneficial for users.

Despite the popularity of diet and fitness apps, longer-term usage can vary, with some users eventually discontinuing their use due to various reasons. For instance, in this study, a majority of participants ($N=34$, 41%) reported using these apps for more than 6 months. However, research by Honary et al. (2019) found that approximately one-third (33.6%) of participants had stopped using fitness apps over time, citing reasons such as the apps being too demanding, a lack of motivation, or having already achieved their health goals. In addition, some participants had to stop using the apps due to pre-existing eating disorders or being in recovery. Similarly, a study by Lindgreen et al. (2021) reported a decline in app use among eating disorder patients over time, which they attributed to changes in participants' symptoms, whether they improved or worsened. Moreover, the long-term use of digital health monitoring technologies to monitor health behaviors can lead to the objectification of the body, where the body is primarily viewed as an object to be measured and optimized. This could create a dissociation between the mind and the body, in which the person may become more focused on achieving specific weight goals rather than responding to their body's internal cues and needs. This may lead to negative emotions and a numbing of the human experience that inhibits the acquisition of healthy behaviors (Toner, 2018, as cited in (Honary et al., 2019).

One important consideration when examining the effects of self-tracking technology is the role of the users themselves. The impact of these technologies is not inherently positive or negative, and as Eikey and Reddy (2017) noted, it depends on how they are used, as well as the users' mindsets and motivations. Using weight loss apps can be potentially harmful for individuals who struggle with eating disorders and poor body image, as these individuals may easily be triggered by tracking their weight and calorie intake (Eikey & Reddy, 2017). Moreover, those with higher levels of perfectionism may be more inclined to exert excessive effort to achieve an ideal body image (Hewitt et al., 1995). On the other hand, for users who are focused on adding more calories or improving their nutrition, food tracking can be a helpful tool to reduce anxiety around weight gain (Eikey & Reddy, 2017). Additionally, research has shown that these technologies can be effective in helping users achieve their fitness goals (Honary et al., 2019) and aiding in the recovery of eating disorder patients through a focus on macronutrients (Eikey & Reddy, 2017).

Nevertheless, the study's limitations should be acknowledged. The sample size was modest, reflecting voluntary participation within a limited 21-day recruitment period, and was skewed toward female participants. This restricts the generalizability of findings. Future research should include larger, more diverse samples and employ longitudinal designs to assess whether perfectionism contributes to the escalation of disordered eating over time.

It is also necessary to acknowledge that existing studies have yet to determine the direction in which calorie-tracking, disordered eating behaviors, and perfectionism interact with each other. For instance, Eikey and Reddy (2017) reported that around 7% of female app users had set weight goals that were below healthy levels, suggesting a focus on unrealistic appearance goals rather than improved health. This finding raises the possibility that some individuals with pre-existing tendencies for disordered eating may be more likely to seek out these apps as a means to pursue unrealistic goals,

rather than the app leading to disordered eating. The causal direction of this relationship is still unclear and requires further investigation.

Conclusion

Through regression analysis, the current study showed that perfectionism was a significant predictor of eating disorder tendencies among users of calorie-counting mobile apps (e.g., MyFitnessPal, Lose It!, FatSecret). The findings suggest that app users with higher levels of perfectionism are more likely to exhibit behaviors associated with eating disorders, supporting the initial hypothesis.

Recommendation

Diet apps' popularity has risen with concerns about their impact on eating behavior, yet research on influencing factors is limited. This study explores perfectionism as a contributing factor to eating disorder tendencies among users of calorie-tracking apps. Findings underscore the need to address risk factors linked to disordered eating, particularly among calorie-conscious users. Additionally, results highlight the necessity for further research and the development of strategies to prevent the harmful effects of diet app use on eating disorders.

Declaration

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Authors' Contributions

TS formulated the research question, organised the research, drafted the manuscript, arranged the research data, and analysed the data. LG reviewed the manuscript, supervised the statistical analysis process, assessed the data processing, and approved the final version of the manuscript.

Conflict of Interest

The author(s) declare no potential conflicts of interest regarding this article's research, authorship, and/or publication.

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