Monitoring eating and activity: Links with disordered eating, compulsive exercise and general wellbeing among young adults

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Abstract

Objective: To explore the relationships between the use of food intake and activity monitoring tools with compulsive exercise, eating psychopathology and psychological wellbeing. **Methods**: Participants (N = 352; mean age 21.90 years) indicated their use of activity and food intake monitoring tools, and completed the Compulsive Exercise Test (CET), Eating Disorders Examination Questionnaire (EDE-Q) and the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS). **Results**: Users of monitoring tools reported significantly higher CET and EDE-Q scores than non-users. Positive associations were detected between the frequency of activity monitoring tool use with CET and EDE-Q scores. Participants who reported using monitoring tools primarily to manage weight and shape reported higher levels of eating and compulsive exercise psychopathology than those who reported using tools to improve health and fitness. **Discussion**: Features of compulsive exercise and eating psychopathology are elevated among users of food intake and activity monitoring tools; and particularly among those who report using the tools for weight and shape purposes. Longitudinal and experimental research is needed to further our understanding of these observed associations, and specifically to explore the prospective relationships between monitoring tool use, eating psychopathology and compulsive exercise.

Key words: Disordered eating, calorie counting, tracking apps, mental health, compulsive exercise

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The use of activity and food intake monitoring tools is on the rise, particularly among young adults (e.g., Krebs & Duncan, 2015). Many smartphones now come with inbuilt health monitors (e.g., iPhone Health); whilst sales of activity monitoring devices are also significantly on the rise (e.g., International Data Corporation, 2016). Exercise and food intake monitoring apps are some of the most popular on the market, with 31% of smartphone owners using apps to monitor their diet and 38% using them to track their exercise (Fox & Duggan, 2012). Motivation to continue use is enhanced by certain features, including the ability to keep detailed records of exercise and food intake and the ability to interact with other users (Lee & Cho, 2016). Apps and other monitoring tool devices are viewed as potentially useful tools for promoting behavior change; for example, increasing physical activity (Alley et al., 2016) and facilitating healthy diets (De Cock et al., 2017; Sarcona, Kovacs, Wright & Williams, 2017).

The premise behind many devices and apps is in their ability to facilitate self-monitoring; a technique that can be an effective mechanism for behavior change, particularly for physical activity and weight loss (e.g., Samdal, Eide, Barth, Williams and Meland, 2017). Self-monitoring is thought to increase self-awareness and elicit behavioral change by providing continuous updates on progress towards a specific goal (Carver & Scheier, 1982). However, engaging in monitoring of food intake and exercise is not necessarily beneficial for everyone. Indeed, eating disorders (ED) are often characterized by obsessive behaviors towards food (e.g., calorie counting), perfectionistic tendencies (e.g., Bardone-Cone et al., 2007; Fairburn, Cooper & Shafran, 2003) and rigid attitudes towards exercise (e.g., Meyer et al., 2016); cognitions and behaviors which could potentially be exacerbated by engaging with monitoring tools.

Indeed, a small number of studies have started to explore associations between monitoring tool use with some aspects of eating psychopathology. For example, elevated levels of eating psychopathology have been reported among users of calorie-tracking tools compared to non-users (specifically dietary restraint and concern about eating; Simpson & Mazzeo, 2017), whilst exercise monitoring has been identified as a unique predictor of eating disorder symptoms (Simpson and Mazzeo, 2017). Body dissatisfaction (a known risk factor for disordered eating; e.g., Neumark-Sztainer, Paxton, Hannah, Haines & Story, 2006) has also been reported to be elevated among those using food intake monitoring tools (Embacher, McGloin & Aitken, 2018). In clinical settings, a large proportion of patients not only use calorie counting tools (e.g., My Fitness Pal), but also perceive the use of such tools to have contributed towards their eating disorder symptoms (Levinson, Fewell & Brosof, 2017). Disturbances in exercise attitudes and wellbeing commonly co-occur alongside eating disorder symptoms (e.g., Fietz, Touyz & Hay, 2014; Tomba et al., 2014), however links with monitoring tool use in these domains have yet to be explored.

Moreover, little is known about user motives for engaging with food and activity monitoring devices, or indeed how these motives might be linked with compulsive exercise, psychological wellbeing and eating psychopathology. Previous research has found that motives for engaging in exercise and/or dieting that are primarily around controlling weight and shape, or in managing negative mood have been linked to more negative psychological outcomes in comparison to health-related motives (O'Brien et al., 2007; Vartanian, Wharton & Green, 2012). Indeed, compulsive exercise has been linked to reduced quality of life and poorer psychological wellbeing in both clinical ED and community samples (Mond, Rodgers, Hay, Owen & Beumont, 2004; Young et al., 2018). Exploring user motives and potential links with eating related psychopathology is therefore an important next step towards

identifying user characteristics that could indicate an elevated risk of disordered eating and poorer mental health.

In summary, there is a small body of literature that has reported associations between food and activity monitoring tool use with body dissatisfaction and eating disorder symptoms (e.g., Embacher et al., 2018; Simpson and Mazzeo, 2017). However, this has yet to be extended to explore links with compulsive exercise cognitions or psychological wellbeing more broadly; disturbances which commonly occur alongside eating disorder symptoms. In addition, little is known about user motivations. Therefore, this study aims to (1) explore whether differences exist in levels of eating psychopathology, compulsive exercise and psychological wellbeing among users and non-users of activity and food intake monitoring tools; and (2) to assess if user profiles differ according to their reported motivations for using monitoring tools. It is predicted that levels of eating psychopathology and compulsive exercise will be significantly higher among users of activity and food intake monitoring tools compared to non-users. Specifically, it is anticipated that those who report using devices for body shape and/or weight reasons will score higher on measures of eating psychopathology and compulsive exercise than individuals who report using them for health or fitness related reasons. Finally, it is predicted that individuals who report using monitoring tools primarily to manage body shape and/or weight will score lower on a measure of psychological wellbeing than those who report using them for other reasons.

Method

Participants

Participants (N = 352; 65% female (n = 228); 82% White British; n = 290) were recruited via opportunity sampling at a UK university campus, via a research participation scheme (in exchange for course credits) and via adverts on social media. The mean age of the

sample was 21.90 years (*SD*= 3.24; range 18-35yrs) and the mean BMI was 22.87 (*SD*= 3.74; range 15.78 –39.45). Participants were able to provide their email addresses for entry into a draw to win a shopping voucher on completion of the study.

Measures

Compulsive Exercise Test (CET; Taranis, Touyz, & Meyer, 2011). The CET is a 24-item self-report measure, comprising of five subscales: Avoidance and Rule Driven Behavior, Weight Control Exercise, Mood Improvement, Lack of Exercise Enjoyment and Exercise Rigidity. Higher scores indicate higher levels of compulsive exercise. All of the subscales were found to have good internal reliability ($\alpha \geq .76$), consistent with previous research (Meyer et al., 2016).

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 2008). The EDE-Q is comprised of 28 items over four subscales (Restraint, Eating Concern, Shape Concern and Weight Concern). Participants report the frequency of eating attitudes and behaviors over the previous 28 days. Frequency of objective binge eating episodes (overeating associated with a loss of control) and purging (self-induced vomiting, laxative misuse, driven exercise) are also recorded. Reliability analysis indicated good reliability for the subscales ($\alpha \geq .81$)

Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS; Tennant et al, 2007). The WEMWBS is a 14-item self-report questionnaire, measuring mental wellbeing. Participants are asked to consider how they have been feeling over the last two weeks, and respond to statements (e.g., “I’ve been feeling good about myself”) on a 5-point Likert scale from “None of the time” to “All of the time”. Higher scores indicate better psychological well-being. The measure has been validated for use in both clinical (Bass, Dawkin, Muncer, Vigurs & Bostock, 2016) and community populations (Tennant et al., 2007). The measure showed good internal consistency($\alpha = .91$); similar to previous research (Tennant et al, 2007).

Inventory of weight-related monitoring tool use. Participants completed an inventory (developed by, and available from the authors) to provide information on their use of activity and food intake monitoring tools. The inventory was comprised of two main sections; part A, which focused on their use of activity monitoring devices; and part B, which focused on their use of food intake monitoring tools. Within each section, participants reported a) whether they used a device b) the type of device used; c) frequency of use; d) their main reasons for use (e.g., one from 'for physical health', 'for mental wellbeing'; 'to lose weight'; 'to build muscle/tone'; 'to burn calories'; 'to reach a step/activity target'; 'to achieve a sporting goal'; 'other') and e) responded to three questions about their perceptions of the tools (perceived helpfulness, level of concern if denied access, and the impact of the device on their activity or eating behaviors). The inventory is available from the authors on request.

Procedure

The study was approved by the institutional review board. Participants were provided with details about the study and were informed that the aim was to explore relationships between the use of activity and food monitoring tools with eating and exercise attitudes and psychological wellbeing. After providing informed consent, participants provided age, gender and self-reported height and weight data (to allow BMI to be calculated). They then completed the inventory of weight-related monitoring tool use; the CET; EDE-Q and WEMWBS (in that order). All responses were stored anonymously.

Data Analysis

EDE-Q subscales were found to be non-normally distributed, so non-parametric tests were used where applicable. Twenty-five participants reported only using food intake monitors, 117 used just activity monitoring devices and 87 used both activity and food intake monitors. Due to the small frequency of participants only using food intake monitoring tools, it was decided to combine the data into two groups (those who monitored; n = 229; and those

who did not; n = 123) to address the first aim. Two-tailed tests of difference were conducted to explore differences between users and non-users of monitoring tools on the CET, EDE-Q and WEMWBS. Correlations were also conducted among users of monitoring tool to explore associations between the frequency of use with CET, EDE-Q and WEMWBS scores. Kruskal-Wallis, Chi-Square and Mann Whitney U analyses were conducted to address the second aim, and explore differences in EDE-Q, CET and WEMWBS scores and disordered eating behaviors in relation to reported reasons for using monitoring tools. Motives for use of activity and food intake monitoring tools were explored separately. All analyses were assessed using a *p* value of $p \leq .01$ to control for multiple comparisons.

Results

Sample characteristics

Characteristics of the total sample, and for the two groups (monitoring tool users and non-users) are presented in Table 1. Scores on the EDE-Q, CET and WEMWBS were on par with other non-clinical, young adult samples (Mond, Hay, Rodgers & Owen, 2006; Taranis et al., 2011; Tennant et al., 2007). The prevalence of binge eating and purging behaviors were similar to levels reported in other undergraduate cohorts (e.g., Lipson & Somerville, 2017). Of those reporting purging behaviors (*n* = 94), the majority reported engaging in driven exercise (*n* = 91; 97%), with small numbers of participants reporting self-induced vomiting (*n* = 6; 6.4%) and laxative misuse (*n* = 5; 5.3%).

Participants who used monitoring tools provided information about the frequency, reasons for use and the perceived helpfulness of the tools. The majority of users of activity (69.7%) and food intake monitoring tools (56.3%) reported using devices either daily or a few times a week. Participants also reported their primary reason for using an activity or food intake monitoring device. For users of activity devices, reasons for using monitoring tools were

condensed into health and wellbeing related reasons (e.g., “for physical health”, “for mental wellbeing”), weight and/or shape reasons (e.g., “to lose weight”, “to build muscle/tone”; “to burn calories”) and fitness or sporting goals (e.g., “to reach a step target”; “to achieve a sporting goal”). Most participants reported health and wellbeing-related reasons as their most important reason for using their activity monitoring device (44%; n = 89), with 31% (n = 62) reporting a weight or shape-related reason, and 25% (n = 50) reporting a goal-related reason. Among users of food intake monitoring tools, 30% (n = 31) reported using the device for health-related reasons (e.g., “to improve health and wellbeing”; “to improve energy levels”) whilst the remainder of the sample reported using a food intake monitoring tool primarily to manage weight and/or shape (70%, n = 73; e.g., “to lose weight”; “to build muscle/tone”). The majority of activity (91%) and food intake monitoring tool users (85%) perceived the tools to be very or somewhat helpful in achieving their desired goals.

Differences in eating psychopathology, compulsive exercise and wellbeing among users and non-users of monitoring tools

Users of monitoring tools reported a higher BMI than non-users. Users also scored significantly higher two of the five CET-subscale scores (CET Weight Control Exercise, CET-Mood Improvement) and on three of the four EDE-Q subscales (EDE-Q-Restraint, EDE-Q Eating Concern, and EDE-Q-Weight Concern), with mostly small to moderate differences detected between the groups. Small, significant differences were identified in prevalence rates of *any reported* purging behaviors (χ^2 (1) = 12.53, p<.001, V = .19), and *frequently reported* purging behaviors (≥4 times in the past 28 days; χ^2 (1) = 11.00, p=.001; V = .17), with users of monitoring tools reporting higher levels compared to non-users. Among participants reporting *any* purging behaviors, 97% of the users (n = 73) and all of the non-users (n = 18) were purging via driven exercise. Among those reporting *frequent* purging

behaviors, all of the users (n = 52) and non-users (n = 10) were purging via driven exercise. No differences were observed between groups for binge eating behaviors or wellbeing scores.

Associations between frequency of monitoring and eating psychopathology, compulsive exercise and wellbeing

Among users of monitoring tools, a significant, moderate positive correlation was observed between the frequency of use of food intake and the frequency of use of activity monitoring devices ($r(87)=.46$, $p<.001$). No significant correlations were observed between frequency of food intake monitoring and any CET, EDE-Q or wellbeing subscale (n = 112, $r \leq .13$; $Rho \leq .23$, n.s). Small, significant positive correlations were observed between the frequency of use of activity monitoring tools with CET Weight Control Exercise scores ($r(204) = .19$, $p<.01$), and with EDE-Q Restraint and Weight Concern scores ($Rho\ (204) \geq .17$, $p \leq .01$). No significant associations were found between binge eating or purging behaviors and frequency of activity or food intake monitoring.

Reasons for using monitoring tools: Differences in eating psychopathology, compulsive exercise and wellbeing.

Reported motives for activity monitoring. A significant, moderately-sized difference in CET Weight Control scores was identified according to reported reasons for use of monitoring tools ($\chi^2(2) = 28.17$; $p<.001$, $\eta p^2 = .12$). As would be expected, participants who reported primarily using activity monitoring devices to manage weight and shape scored higher on CET Weight Control Exercise than those who reported using devices for other reasons. Participants who reported using activity monitoring devices to manage weight and shape also scored significantly higher (small to moderate effects) on some of the EDE-Q subscales in comparison to participants citing other reasons (notably, EDE-Q Restraint, Shape Concern and Weight Concern; $\chi^2(2) \geq 10.38$; $p \leq .01$; $\eta p^2 \geq .05$; as seen in Table 2).

Participants who reported primarily using monitoring tools to manage shape and weight (n = 32; 52%) reported significantly higher rates of purging behaviors than those who reported using the tools for health and fitness (n = 29; 33%) or to achieve a fitness/sporting goal (n = 6, 12%; $\chi^2(2) = 19.61$; $p < .001$; V = .32). No significant differences in binge eating behaviors or wellbeing scores were observed according to reported reasons for activity monitoring.

Reported motives for food intake monitoring. Significant, small to moderate group differences were identified for CET Weight Control scores ($Z = 4.03$; $p \leq .01$; $r = .40$), and EDE-Q Shape Concern and Weight Concern scores ($Z \geq 2.90$; $p \leq .01$; $r \geq .28$; Table 3). Specifically, participants who reported using food intake monitoring tools to manage weight and shape showed significantly higher scores compared to those citing health-related reasons. No significant differences were detected for the prevalence of binge eating or purging behaviors, or for wellbeing scores according to reported reasons for food intake monitoring.

Discussion

This study had two aims: (1) to explore whether differences exist in levels of eating psychopathology, compulsive exercise and psychological wellbeing among users and non-users of activity and food intake monitoring tools; and (2) to assess if user profiles differ according to their reported motivations for using monitoring tools. Users of monitoring tools were reported higher levels of dietary restraint and concerns about eating and weight compared to non-users, which is consistent with previous research (e.g., Embacher et al., 2018; Simpson & Mazzeo, 2017). Novel outcomes emerged in relation to the increased prevalence of purging behaviors (specifically driven exercise) and the higher levels of compulsive exercise reported by users of monitoring tools. Small positive associations were identified between frequency of activity monitoring and levels of compulsive exercise and

eating psychopathology. Participants who reported using monitoring tools primarily for weight and shape purposes reported higher levels of pathology (dietary restraint, concerns over weight and shape, exercising for weight control, and purging behaviors) than those who reported using the tools for health-related reasons. It is, however, noted that the magnitude of these effects were mostly small.

The results of this cross-sectional study could simply reflect that participants with disordered eating and compulsive exercise tendencies may be more likely to engage in monitoring of food intake and exercise behavior. Alternatively, it is possible that self-monitoring of food intake and activity could inadvertently validate features of compulsive exercise among vulnerable individuals (e.g., obsessive and rigid exercise attitudes and behaviors; Meyer, Taranis, Goodwin and Haycraft, 2011). However, causal relationships between monitoring tool use and features of eating and exercise psychopathology can't be inferred from this study; therefore, it is essential that future research in this area adopts prospective and experimental designs to generate further understanding of the mechanisms underpinning the observed associations. It will also be important to identify and prospectively explore aspects of device feedback that may be particularly salient to users (e.g., number of steps, calories burned) and to differentiate between monitoring of food intake and activity behaviors. Due to small numbers of participants exclusively using food intake devices, comparisons between food intake and activity monitoring tool users were not possible in this study. It will also be important to consider the role of other potentially important explanatory variables (e.g., self-critical perfectionism; gender; age).

No differences in psychological wellbeing were reported between users and non-users; or according to reported reasons for using monitoring tools. This contrasts with previous literature that has identified more negative psychological outcomes among those who report dieting or exercising for weight-related motives in comparison to health-related

motives (O'Brien et al., 2007; Vartanian et al., 2012), and reduced quality of life among individuals with compulsive exercise and eating psychopathology (Mond et al., 2004; Young et al., 2018). It is plausible to suggest that any negative effects of monitoring are off-set by increases in feelings of physical wellness, perhaps as a result of changes to physical activity, dietary practices or as a result of observing progress towards one's goal. Indeed, most users in this study perceived monitoring tools to be helpful in achieving their desired goals. Goal attainment is an important contributing factor for psychological wellbeing (e.g., Sheldon & Elliot, 1999), and can be facilitated by self-monitoring (Harkin et al., 2016). Furthermore, users of monitoring tools in this study endorsed exercising for mood improvement more so than non-users, which may serve to moderate any negative impacts of monitoring on wellbeing; however, further research is needed to identify for whom, and in what circumstances monitoring may be beneficial or harmful. Future studies may consider including specific measures of depression and/or anxiety, to allow for a more nuanced evaluation of links between psychological wellbeing and monitoring tool use.

Elevated levels of attitudinal aspects of eating psychopathology (notably, dietary restraint, weight and shape concern) and increased purging behaviors were reported among those who endorsed using devices for weight and shape reasons; however, no differences were reported for binge eating. The reported levels of binge eating in the sample were high, (although on par with other student samples; e.g., Lipson & Sonneville, 2017), which contrasted with the comparatively lower levels of attitudinal psychopathology (Mond et al., 2006; Taranis et al., 2011; Tennant et al., 2007). Some sampling biases may have occurred, as the study aim was disclosed to participants at recruitment as part of informed consent. Self-report assessments, particularly for the behavioral aspects of disordered eating can generate elevated scores and are potentially unreliable due to differences in participants' interpretation of items measuring binge eating (Goldschmidt, 2017; Mond, Hay, Rodgers,

Owen & Beumont, 2004; Reslan & Saules, 2011), which could have impacted upon the findings. In addition, the measure of monitoring tool use was developed for the purpose of the study and would benefit from further validation. Specifically, it will be important to explore potential social desirability influences on reported motives for use of monitoring tools.

Moreover, the vast majority of reported 'purging' behavior was via driven exercise, with very few participants reporting other forms of purging. Exercise may be considered a more socially acceptable method of weight control and emotion regulation. However, recent evidence has highlighted the seriousness of driven exercise, even when it occurs in the absence of binge eating or other purging behaviors; 'driven exercisers' were found to report equivalent levels of eating psychopathology as those who reported purging via other mechanisms (Lydecker, Shea & Grilo, 2018). Further exploration is needed to identify if, and how monitoring tool use is linked to driven exercise behavior. Gold standard interviews should be employed to more accurately ascertain behavioral and attitudinal features of eating psychopathology (e.g., Eating Disorders Examination, Fairburn & Cooper, 1993), and clinical populations should be included for comparison.

For many, monitoring food and exercise activity is likely to be a helpful mechanism by which to achieve positive behavior change (Samdal et al., 2017). However, the findings of this study suggest it may be pertinent to provide guidance around the safe use of monitoring tools to young people, teachers and parents. Similarly, it may be useful to incorporate questions around the use of monitoring tools into screening for eating psychopathology and compulsive exercise. Companies developing such technologies may consider including a pre-use screen to identify motivational factors and work alongside eating disorder professionals to provide appropriate in-app signposting and support.

In summary, this study extends our existing understanding of the associations between the use of monitoring tools with eating psychopathology, compulsive exercise and psychological wellbeing. It is the first known study to explore how reported motives for use of monitoring tools are related to features of eating psychopathology and compulsive exercise. The findings suggest that users of food intake and activity monitoring tools (and particularly those reporting using them for weight and shape purposes) may be an important group for targeted intervention. It may be pertinent to consider the provision of guidance around the use of monitoring tools, and to include questions around monitoring tool use when screening for eating psychopathology and compulsive exercise. Future longitudinal and experimental research in this area is essential to further our understanding of the dynamic relationships between monitoring, compulsive exercise and eating psychopathology.

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Table 1: Descriptive information for users and non-users of activity and food intake monitoring tools.

	Total sample (N = 352)	**Users (n = 229)**	**Non-users (n = 123)**	**Z / t / χ^2**	**Effect size**
Gender	65% female (n = 228)	69% female (n = 158)	57% female (n =70)	-	-
Age	21.90 (3.24)	22.01 (3.35)	21.77 (3.13)	.66	.07
BMI	22.87 (3.74)	23.23 (4.02)	22.19 (3.03)	**2.46***	**.29**
CET Avoidance	1.79 (1.03)	1.85 (1.06)	1.68 (.98)	1.44	.17
CET Weight Control Exercise	2.57 (1.15)	2.75 (1.10)	2.21 (1.17)	**4.28****	**.48**
CET Mood Improvement	3.22 (1.00)	3.31 (.94)	3.04 (1.08)	**2.49***	**.27**
CET Lack of Exercise Enjoyment	1.64 (1.10)	1.62 (1.09)	1.67 (1.11)	.39	.05
CET Exercise Rigidity	2.75 (1.20)	2.83 (1.18)	2.61 (1.23)	1.68	.18
EDE-Q Restraint	1.17 (1.25)	1.39 (1.30)	.75 (1.04)	**4.97****	**.26**
EDE-Q Eating Concern	.66 (1.01)	.74 (1.04)	.50 (.94)	**2.78***	**.15**
EDE-Q Shape Concern	2.02 (1.60)	2.14 (1.61)	1.81 (1.55)	1.85	.10
EDE-Q Weight Concern	1.71 (1.52)	1.87 (1.53)	1.42 (1.47)	**2.93***	**.16**
Binge eating (n; %)	138 (39%)	96 (42%)	42 (34%)	1.83	.07
Binge eating ≥ 4 times in the past 28 days	72 (20%)	51 (22%)	21 (17%)	1.22	.06
Purging (n; %)	93 (26%)	75 (33%)	18 (15%)	**12.53****	**.19**
Purging ≥ 4 times in the past 28 days	62 (18%)	52 (23%)	10 (8%)	**11.00****	**.17**
Warwick-Edinburgh Mental Wellbeing Scale	48.99 (8.28)	48.72 (8.50)	49.48 (7.86)	.81	.09

*$p \leq .01$; **$p \leq .001$

Table 2: Differences in CET, EDE-Q and WEMWBS scores according to reasons for use of activity monitoring tools

	Primary reason for monitoring activity							
	To manage weight/ shape (W, n = 89)		**To improve health and wellbeing (H, n= 62)**		**To achieve a fitness/ sporting goal (F, n = 50)**		**Kruskal Wallis χ^2 (ηp^2)**	**Sig Pairwise comparisons**
	M	**SD**	**M**	**SD**	**M**	**SD**		
CET Weight Control Exercise	3.34	.92	2.55	1.13	2.37	1.03	**28.17** (.12)**	W > H; W > F
CET Avoidance	1.84	1.03	1.95	1.08	1.63	1.08	2.57 (.01)	-
CET Mood Improvement	3.41	.96	3.41	.88	3.12	1.04	2.99 (.01)	-
CET Lack of Exercise Enjoyment	1.66	1.11	1.40	.85	1.76	1.30	1.90 (.01)	-
CET Exercise Rigidity	2.91	1.29	2.99	1.06	2.40	1.18	7.80 (.04)	-
EDEQ Restraint	1.78	1.45	1.16	1.14	1.06	1.21	**10.38* (.05)**	W > H; W > F
EDE-Q Eating Concern	1.05[a]	1.18	.66[a]	1.12	.58	.75	6.60 (.03)	-
EDE-Q Shape Concern	2.91	1.71	1.78	1.47	1.67	1.45	**20.46** (.09)**	W > H; W > F
EDE-Q Weight Concern	2.58	1.65	1.60	1.38	1.45	1.49	**18.62** (.09)**	W > H; W > F
WEMWBS	47.95	8.73	48.75	8.44	50.14	8.34	1.58 (.01)	-
BMI	24.13	4.21	22.74	3.80	22.81	4.14	5.38 (.03)	-

$^{*}p \leq .01$ $^{**}p \leq .001$

Table 3: Differences in CET, EDE-Q and WEMWBS scores according to reasons for use of food intake monitoring tools.

	Primary reason for monitoring food intake					
	Weight related reasons (n = 73)		**Health-related reasons (n = 31)**			
	M	**SD**	**M**	**SD**	**Z**	**Effect size**
CET Weight Control Exercise	3.24	1.00	2.39	.90	**4.03***	**.40**
CET Avoidance	2.11	1.12	1.86	1.01	.89	.09
CET Mood Improvement	3.45	.88	3.27	.90	.91	.09
CET Lack of Exercise Enjoyment	1.73	1.10	1.46	1.02	1.07	.11
CET Exercise Rigidity	3.00	1.16	3.00	1.10	.05	.00
EDEQ Restraint	1.93	1.36	1.46	1.15	1.68	.16
EDE-Q Eating Concern	1.04	1.15	.77	1.16	1.30	.13
EDE-Q Shape Concern	2.94	1.76	1.87	1.44	**2.90***	**.28**
EDE-Q Weight Concern	2.63	1.62	1.46	1.37	**3.41***	**.33**
WEMWBS	47.18	9.40	68.00	9.94	1.11	.11
BMI	24.24	4.47	22.69	4.81	2.31	.23

*$p \leq .01$ **$p < .001$