

The Interplay Between Depression, Anxiety, Interpersonal Problems, Self-Weighing and Overall Eating Styles of University Students

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The world is facing an epidemic of obesity. As a result, it is vital that the contributing factors of this issue are identified and addressed. The aim of this study was to investigate the interplay between overall eating style scores in college age students with depression, anxiety, interpersonal problems and self-weighing. The present study consisted of 170 participants (73% female). The results indicated that when social desirability, gender and race were controlled for, depression, interpersonal problems, and self-weighing significantly negatively contributed to overall eating style scores. When self-weighing and interpersonal problems were accounted for, anxiety was found to not significantly predict overall eating styles. Depression, anxiety, interpersonal problems and self-weighing accounted for 20% of overall eating style scores. When all other values had been accounted for, depression was the most reliable predictor and accounted for an additional 6% of the variance. Together these findings suggest that depression, anxiety, interpersonal problems and self-weighing play a role in the development of unhealthy eating habits and by extension, obesity.

Keywords: obesity, eating habits, depression, anxiety, interpersonal problems

There are approximately 1.3 billion people worldwide who are overweight or obese (United Nations Human Rights Council, UNHRC, 2011). Since obesity is a leading cause of death and disease, it is now being treated as a chronic disease (Withrow & Alter, 2010). Obesity often results in physical issues such as cardiovascular disease, type 2 diabetes, some cancers, musculoskeletal, skin and respiratory problems, and psychosocial problems including eating disorders and depression (NHMRC, 2012). Obese individuals are often highly stigmatized and face various forms of prejudice and discrimination (Sechrist et al., 2005; Teachman et al., 2005), especially from health care professionals (Foster et al., 2012; Lee & Calamaro, 2012).

The cause of obesity has been attributed to metabolic factors (Bray & DeLany, 2012), excessive consumption of obesogenic foods (Wilding, 2012), genetics (Lyon & Hirschhorn, 2005), and environmental contributions such as increased use of transport (e.g., cars; Wilding, 2012). In addition to these factors, a growing body of research indicates that eating styles may be a significant contributor to obesity (Boutelle, Neumark-Sztainer, Story, &

Resnick, 2002; Gorin, Phelan, Raynor, & Wing, 2011; Snoek, Van Strien, Janssens, & Engels, 2007; Veltsista et al., 2010).

In an attempt to identify why some individuals eat more than others, three main eating styles have been investigated extensively (Alberts, Thewissen, & Raes, 2012). The first style, restrained eating, involves the restriction of food intake or dieting (Alberts et al., 2012) and may lead to binge eating behaviors (Veltsista et al., 2010). Individuals who restrict their food intake suppress their feelings of hunger and eat less (Snoek et al., 2007). Restrained eaters are more likely to overeat than individuals who are not restricting (Ruderman, 1986).

The second eating style is external eating. External eating is eating in response to external cues (Alberts et al., 2012). The external eating theory proposes that certain people are more susceptible to external food cues (e.g., seeing food on a television advertisement) than others and eat in response to these cues, regardless of their internal state of hunger and satiety (Alberts et al., 2012). Individuals who are external eaters are more likely to snack in stressful situations (Conner, Fitter, & Fletcher, 1999) and have

feelings of low self-worth (Braet & Van Strien, 1997).

The third main eating style is emotional eating. Emotional eating has been defined as eating in response to negative emotions (Van Strien, Frijters, Bergers, & Defares, 1986). Snoek and colleagues' (2007) Psychosomatic Theory posits that emotional eaters do not eat in response to internal signals of hunger or satiety but in response to their emotions. When emotional eaters experience stress they respond by eating excessively. In comparison non-emotional eaters in a similar situation would be more likely to lose their appetite (Greeno & Wing, 1994).

Over the last few years, researchers have not only re-shaped the scope of eating styles but have attempted to gain an insight into how different eating styles emerge, how to measure differing styles, and how to address the negative consequences of each style (Scherwitz & Kesten, 2005). While past research has examined how eating styles contribute to obesity, researchers have just begun to explore why there are individual differences in eating styles, and why an individual adopts a particular style. Emotional states may exert significant influence on eating behaviors, resulting in either over-eating or under-eating, and a consequence of these eating behaviors can be obesity (Geliebter & Aversa, 2003). As a result, there is a growing interest in the mechanisms that contribute to eating behaviors. Studies that have explored this area have mainly focused on psychological factors, such as depression and anxiety (Geliebter & Aversa, 2003).

Depression, Anxiety and Eating Styles

A review by the National Institutes of Health (NIH; 2008) found that some 20% of adolescents suffer from bouts of anxiety and depression before they reach adulthood. There is a high prevalence of distress in university students and relatively low levels of professional help-seeking in students, despite access to free counseling and health services (NIH, 2008). Depression has a significant impact on the capacity of students to study and is associated with lower academic performance. One specific eating style that has been extensively researched in relation to depression is emotional eating, and it has been found to be the most influential predictor of depression (Kontinen, Mannisto, Sarlio-Lahteenkorva, Silventoinen, & Haukkala, 2010; Ouwens, Van Strien, & Leeuwe,

2009). Certain foods too have been associated with depressive symptoms (Sarlio-Lahteenkorva, Lahelma, & Roos, 2004), for example more energy dense sweet foods (Jeffery et al., 2009).

Norwood, Rawanna and Brown (2013) recently investigated eating- and weight-related disturbances in emerging adults (18 to 25 years) in relation to depressive symptoms. There was a significant relationship between eating in response to emotional arousal and depressive symptoms, as well as between maternal relationships and depressive symptoms among these young adults. Less supportive relationships were also significantly associated with higher levels of depressive symptoms. Assessing interpersonal and parental relationships appears to be a critical factor when working with young adults who have weight and food concerns and depression.

Only one known study has looked at whether depression is associated with an individual's entire eating pattern. Kuczmarski et al. (2010) are some of the first researchers to examine this relationship. Eating quality was measured using the Healthy Eating Index. The higher a participant's score, the more a person's overall eating pattern corresponded with the 2005 Dietary Guidelines for Americans, and the better the diet quality. Essentially this meant participants were consuming a variety of nutrient-dense foods and beverages within and among the basic food groups, while choosing foods that limited the intake of saturated and trans fats, cholesterol, added sugars, salt, and alcohol. The study found that overall eating quality was significantly associated with reported symptoms of depression. Participants who had a high-quality eating style reported fewer depressive symptoms (Kuczmarski et al., 2010). While these results indicate a significant association between depression and overall eating pattern, the design of this study was based on American eating guidelines. It is therefore unknown whether these results can be generalised to other countries.

Numerous explanations of the association between eating and anxiety have been hypothesized. The comfort hypothesis (Dallman et al., 2003; Orbach, 1978) holds that consumption of high fat and carbohydrate foods provides comfort to anxious dieters or people who are obese. One issue with this hypothesis is that this explanation does not consider

eating to be comforting to non-dieters or non-obese individuals (Polivy, Ouwens, & McFarlane, 1994). An alternative hypothesis suggests that eating may serve as a distraction from a person's anxieties (Herman & Polivy, 1975).

Interpersonal Problems and Self Weighing

Research has established a strong link between disordered eating and interpersonal problems (Ambwani & Hopwood, 2009; Evans & Wertheim, 2005); however, no such link has been established between interpersonal problems and eating styles. Interpersonal problems, i.e., difficulties relating to others and forming satisfying, mutual relationships, have been suggested to be a fundamental component in eating disorders (Hartmann, Zeeck, & Barrett, 2010). They have been suggested to be a core feature in the development of an eating disorder, act to maintain the disorder, and develop as a result of an eating disorder (Connan, Troop, Landau, Campbell, & Treasure, 2007; McIntosh, Bulik, McKenzie, Luty, & Jordan, 2000; Steiger & Houle, 1991). Interpersonal problems incorporate a wide range of issues related to an individual's social interactions and engagement with other people, such as family, friends or the work environment (Ambwani & Hopwood, 2009). Research has consistently demonstrated that bulimic symptoms are associated with a range of interpersonal difficulties, and that elevated interpersonal problems continue years after a person is initially diagnosed with an eating disorder (Atlas, 2004; Hopwood, Clarke, & Perez, 2007). Interpersonal problems have also been linked to binge behaviour. Coco, Gullo, Salerno and Iacononelli (2011) found that low self-esteem and interpersonal hostility were associated with binge behaviors in obese participants. Studies also support the link between interpersonal problems and obesity (Coco et al., 2011); however, no known study has explored the possible association of interpersonal problems and eating styles.

Research into the positive and negative effects of self-weighing is new and under-researched. Studies have shown that self-weighing is a successful strategy for weight loss or prevention of weight gain (Linde, Jeffery, French, Pronk, & Boyle, 2005). The National Weight Control Registry found that self-weighing at least once a week can help people successfully lose

weight (Klem, Wing, McGuire, Seagle, & Hill, 1997). Indeed, reducing the frequency that a person weighs themselves has been independently linked with weight gain (Butryn, Phelan, Hill, & Wing, 2007). However, Neumark-Sztainer, van den Berg, Hannan, Stat and Story (2006) found that in females frequent self-weighing predicted a higher frequency of binge eating and unhealthy weight control behaviors (e.g., skipping meals, smoking more cigarettes, taking diet pills; Neumark-Sztainer et al., 2006).

Present Study

The aim of this study was to investigate the interplay between eating styles and depression, anxiety, interpersonal problems and self-weighing behaviors among university students. The interplay between a selected eating style or a particular food and depression, and the relationship between a selected eating style or a particular food, and anxiety are both well established (Kuczmarski et al., 2010; Yannakoulia et al., 2008). However, only one known study has examined the associations between overall eating styles and depression, and that experiment used a measure that may only be relevant to the American population (Kuczmarski et al., 2010). For the purpose of the present study, eating style was operationalized using the Seven Eating Styles Questionnaire (SESQ; Scherwitz & Kesten, 2005), which has been used worldwide. By looking at a person's overall eating style in its entirety, research may be able to enhance the understanding of eating styles and contribute to the development of obesity interventions. No studies to date have examined the relationship between eating styles and interpersonal problems and eating styles and self-weighing.

In order to accurately study eating styles, it was necessary to control for other factors known to covary with this variable. Gender is one factor that has consistently been associated with eating styles (Deshpande, Basil, & Basil, 2009; Racette, Deusinger, Strube, Highstein, & Deusinger, 2005). Huang, Song, Schemmel and Hoerr (1994) found that men consume higher calories and high fat foods, more fast foods and fewer vegetables than women. Research also indicates that females skip meals (Shaw, 1998) and are at a greater risk for poor dietary habits than males (Videon & Manning, 2003).

Table 1
Demographic Information

	N	Percentage
Gender		
Female	124	72.9
Male	46	27.1
Relationship Status		
Single	129	75.9
De-facto relationship	26	15.3
Married	13	7.6
Divorced	2	1.2
Highest level of education		
Not finished high school	1	.61
High school	86	50.6
Vocational	18	10.6
Undergraduate degree	53	31.2
Postgraduate degree	7	4.1
Master's degree	4	2.4
Doctorate degree	1	.6
Ethnicity		
Caucasian	140	82.4
Asian	11	6.5
Indigenous Australians	2	1.2
Mixed Race	2	1.2
Pacific Islander	1	.6
Person	1	.6
Eurasian	1	.6
Norwegian	1	.6
Scandinavian	1	.6
Middle-Eastern European	1	.6
European	1	.6
Middle Eastern	1	.6
African (Eritrean)	1	.6
Arab	1	.6
Latin American	1	.6
Hispanic	1	.6
Self-weighing in the past month		
Never	54	31.8
Once a month	57	33.5
More than once this month	22	12.9
Once a week	13	7.6
More than once a week	14	8.2
Every day	10	5.9

Race is another variable that has been found to play a role in eating styles. Videon and Manning (2003) found that African Americans and Hispanics when compared to Caucasians were at a greater risk for poor intake of vegetables. Asians have also been found to be significantly less likely than Caucasians to report consumption of fruits and vegetables, and Asians consume less calcium than Caucasians (Videon & Manning, 2003). Once gender and race were controlled as covariates, the current study could more accurately assess the interplay between overall eating styles, depression, anxiety, interpersonal problems and frequency of self-weighing.

Drawing on the existing base of research in this area, the following hypotheses were formulated for the current study: 1) lower eating styles total scores, as measured by the SESQ, would be associated with significantly higher self-reported scores of depression, as measured by scores on the Depression Anxiety Stress Scales-21; 2) lower eating styles total scores, as measured by the SESQ, would also be associated with significantly higher self-reported scores of anxiety, as measured by scores on the Depression Anxiety Stress Scales-21 (DASS-21; Lovibond, & Lovibond, 2002); 3) lower eating styles total scores, as measured by the SESQ, would also be associated with significantly higher self-reported scores of interpersonal problems, as measured by the Inventory of Interpersonal Problems (IIP; Horowitz, Alden, Wiggins, & Pincus, 2000); 4) lower eating styles total scores, as measured by the SESQ, would also be significantly associated with more frequent self-weighing; and 5) depression would account for more significant variance in total eating style scores, than anxiety, self-weighing and interpersonal problems.

Method

Participants

Participants were 170 Australian University students. There were a total of 124 females (72.9%) and 46 males (27.10%). Participants ranged in age from 18 to 52, with a mean age of 22 ($SD = 5.82$). See Table 1 for demographic information.

Materials

Demographic questionnaire. Participants were instructed to complete demographic questions relating to gender, age, race, highest level of education, current relationship status and how often they had weighed themselves in the past month.

Seven Eating Styles Questionnaire (SESQ). Scherwitz and Kesten (2005) developed the SESQ, an 80-item questionnaire, designed to measure the seven eating styles that have been linked to overeating, overweight and obesity. The questionnaire consists of seven subscales: emotional eating; fresh food, fast food; food fretting; task snacking, sensory, spiritual nourishment; eating atmosphere and social fare. Subjects are required to respond to the seven eating styles questionnaire by selecting the answer that best represents their current eating styles on a 6-point Likert Scale, between 0 (never) and +5 or -5 (always). Each subscale consisted of negatively and positively scored items. The total scores are calculated by adding all of the participant's positive scores together and then subtracting the total of the negative scores. This results in the participant's total interactive eating styles score. Participants who have a score of 131 or above have excellent interactive eating styles (practicing the seven eating styles and eating optimally most of the time), 57 to 130 have good interactive eating styles (eat optimally sometimes), -16 to 56 have satisfactory interactive eating styles (food and eating are often issues), and a score of -15 and below have interactive eating styles that need improvement (eating style is far from optimal or integrative).

Based on a survey that consisted of 5,256 participants, the identified seven factors were found to be coherent and consistent after the sample was randomly split in two and factor analysed (Scherwitz, & Kesten, 2005). Cross sectional analyses indicated

that the emotional eating factor was positively associated with self-reported frequency of overeating and the likelihood of being obese (Scherwitz, & Kesten, 2005). The SESQ for the present study had a Cronbach's Alpha of .91.

Depression Anxiety Stress Scales-21 (DASS-21). The DASS-21 (Lovibond & Lovibond, 2002) is a 21 item questionnaire that is derived from the original DASS, which is a 42-item questionnaire. The DASS-21 consists of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. The Depression Scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest or involvement, anhedonia and inertia. The Anxiety Scale assesses autonomic arousal, skeletal muscle effects, situational anxiety and subjective experience of anxious affect. The Stress Scale assesses difficulty relaxing, nervous arousal and being easily upset or agitated, irritability or over-reaction and impatience. For the purpose of this study, only the items related to depression and anxiety were utilised. Respondents rate the degree to which each symptom was experienced over the past week on a 4-point likert-type scale between 0 (did not apply to me at all) and 3 (applied to me very much, or most of the time). The scale is not directly applicable to a subject's temporary emotional state (Lovibond, & Lovibond, 2002). The subscale scores are calculated by adding the participant's responses to the seven items from each subscale and then multiplying this score by two (Norton, 2007). Depression scores between 0 and 9, and anxiety scores between 0 and 7, indicate normal levels. Depression scores between 10 and 13, and anxiety scores between 8 and 9 indicate mild levels. Moderate scores for depression are between 14 and 20, and between 10 and 14 for anxiety. Severe levels of depression are between 21 and 27, and between 15 and 17 for anxiety. Extremely severe levels for depression are above 28, and above 20 for anxiety.

A large body of research indicates that the DASS-21 has excellent internal consistency and test-retest reliability (Anthony, Bieling, Cox, Enns, & Swinson, 1998; Henry, & Crawford, 2005; Lovibond, & Lovibond, 2002).

Social Desirability Scale. A shortened version of Marlowe and Crowne's Social Desirability Scale

Table 2

Inter-correlations of Social Desirability, Gender, Race, Self-Weighing, Depression, Anxiety, Interpersonal Problems, and Total Eating Styles (N = 170)

Variable	M	SD	1	2	3	4	5	6	7	8
1. Social Desirability	15.21	3.58	–							
2. Gender	–	–	-.06	–						
3. Race	–	–	-.05	.03	–					
4. Self-weighing	–	–	.05	.01	-.15	–				
5. Depression	8.78	8.73	.10	.06	-.03	-.03	–			
6. Anxiety	8.06	8.25	.10	.16*	.01	.12	.60**	–		
7. Interpersonal Problems	38.44	19.33	.10	.21**	-.07	.13	.47**	.42**	–	
8. Total Eating Styles	40.21	32.85	-.21**	-.08	.15	-.22**	-.40**	-.28***	-.35***	–

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

developed by Ray (1984) was used. The shortened version consists of eight questions taken from the original 33 items. The purpose of the Social Desirability Scale is to determine whether participants answer in a socially desirable manner. (Wester, Willse, & Davis, 2008). Respondents are required to select either yes, no or unsure when answering each question. Items that are marked yes receive three points, unsure receives two points and no receives one point. Four of the eight items are reverse coded. Higher overall scores indicate a greater tendency to respond in a socially desirable manner. The Social Desirability Scale has been shown to have alpha reliabilities of .74 to .77.

Inventory of Interpersonal Problems 32 (IIP-32). The IIP-32 is a 32 item self-report measure that was shortened from the IIP-64 (Horowitz, Alden, Wiggins, & Pincus, 2000). The IIP-32 has been used extensively with outpatients and in non-clinical settings. The IIP-32 consists of eight 4-item subscales: domineering/controlling, vindictive/self-centered, cold/distant, socially inhibited, non-assertive, overly accommodating, self-sacrificing and intrusive/needy. Subjects are required to rate the degree to which they have had difficulty with a variety of interpersonal problems on a 5-point Likert Scale, ranging from 0 (not at all) to 4 (extremely). Subscale scores range from 4 to 16 and a total score is

calculated by summing the subscale scores together. Higher scores on all subscales indicate greater levels of interpersonal difficulties. The IIP-32 has adequate to strong internal consistency (Cronbach's alpha of 0.68-0.93) and test-retest reliability ($r = 0.57-0.82$).

Three further self-report measures were used in this study, but are not reported here. These included the Patient Health Questionnaire-15 (Spitzer, Kroenke, & Williams, 1999), the Multidimensional Health Locus of Control Scales (Wallston & Wallston, 1978), and the Situational Self-Awareness Scale (Govern & Marsch, 2001).

Procedure

Ethical clearance was obtained from Bond University Human Research Ethics Committee (BUHREC) prior to commencement of this research. Participants were required to be at least 18 years of age and responded to a call for participants by the researchers. The survey was offered online and all participants first read an explanatory statement pertaining to the study and indicated informed consent by completing the questionnaires. Participants then completed demographic questions followed by a battery of seven questionnaires, four of which were used in this study. Questionnaires were counterbalanced and titles of measures were removed to reduce order and social desirability effects respectively. A Social Desirability

Table 3
Hierarchical Multiple Regression with Overall Eating Style Predicted from Self-Weighing, Interpersonal Problems, Anxiety and Depression and Controlled for by Social Desirability, Gender and Race (N = 170)

Predictor	ΔR^2	β	B	SE B	95% CI for B
Step 1	.07**				
Constant			71.09	11.84	[47.71, 94.46]
Social Desirability		-.21**	-1.88	.69	[-3.24, -.52]
Gender		-.10	-7.00	5.53	[-17.91, 3.91]
Race		.14	1.30	.69	[-.06, 2.67]
Step 2	.04*				
Constant			80.55	12.23	[56.41, 104.68]
Self-weighing		-.19*	-4.15	1.63	[-7.37, -.93]
Step 3	.08***				
Constant			90.59	11.96	[66.98, 114.20]
Interpersonal Problems		-.30**	-.50	.12	[-.75, -.26]
Step 4	.02				
Constant			89.01	11.92	[65.48, 112.53]
Anxiety		-.14	-.55	.31	[-1.17, .06]
Step 5	.06***				
Constant			91.41	11.48	[68.74, 114.07]
Depression		-.35**	-1.30	.35	[-1.98, -.62]
Total R ² = .27**					

Note: CI = confidence intervals. * $p < .05$, ** $p < .01$, *** $p < .001$.

scale was included to determine whether participants answered the questions in a socially desirable manner, as students were allowed to gain credit points for participating. To control for the tendency of respondents to answer questions in a manner that would be viewed favorably by the researchers, the social desirable questionnaire was entered in Step 1 of the Hierarchical Multiple Regression.

Results

Prior to analyses all variables were examined for ratio of cases to IVs, missing values, outliers, normality, linearity, homoscedasticity of residuals, and multicollinearity and singularity. Of the original 199 cases, two were under the age of 18 years of age and therefore their data was deleted. Of the remaining 197 cases, missing data was identified in

45 cases, and 27 cases were missing more than half of the questionnaires. As such, they were deleted from the sample. Little’s Missing Completely at Random Test (MCAR) was conducted on the remaining 18 cases with data missing, as missing data should not be assumed to be missing at random (Tabachnick, & Fidell, 2013). The missing data analysis resulted in, chi-square = 1931.50 ($df = 1933$, $p = .51$, $\alpha = .05$), which indicated that the missing values were completely at random. The test also showed that the values were less than 5% for each subscale. Missing values for each of the 18 cases were replaced with an individual mean from Little MCAR Test. Evaluation of descriptive statistics, with and without mean substitution, indicated that mean substitution made no significant difference to the data set resulting in all cases being retained. The final sample consisted of 170 participants.

Descriptive statistics

Prior to main analyses, un-centred means, standard deviations and inter-correlations of the independent variable, the dependent variables and the covariates were ascertained. As can be seen in Table 2, overall eating style scores were significantly negatively correlated with social desirability, self-weighing, depression, anxiety and interpersonal problems, such that lower overall eating scores indicated higher scores on social desirability, depression, anxiety and interpersonal problems and more frequent self-weighing. Gender was significantly positively correlated with depression and anxiety, such that being male was associated with higher depression and anxiety. Race was not significantly associated with any of the variables. Depression was significantly positively correlated with anxiety and interpersonal problems, indicating that higher depression scores were associated with higher levels of anxiety and interpersonal problems scores. Anxiety was also significantly positively correlated with interpersonal problems, such that higher anxiety scores were associated with higher interpersonal problems scores.

Hierarchical Multiple Regression (HMR) Analyses

Hierarchical Multiple Regression (HMR) was employed to investigate the interplay between eating styles and depression, anxiety, interpersonal problems and self-weighing, among University students, after controlling for social desirability, gender and race. Based on the literature, social desirability, gender and race were entered on Step 1 as covariates. Self-weighing, interpersonal problems, anxiety and depression were also entered into the HMR. As demonstrated in Table 3, social desirability, gender and race explained a significant 7% of the variance in overall eating style scores, R^2 change = .07, F change (3, 166) = 4.23, p = .007, such that the covariates were predictive of lower eating style scores. At Step 2, self-weighing explained an additional significant 4% of the variance in overall eating style scores, R^2 change = .04, F change (1, 165) = 6.48, p = .012, such that self-weighing was predictive of lower eating style scores. At Step 3, interpersonal problems explained an additional significant 8% of the variance in overall

eating style scores, R^2 change = .08, F change (1, 164) = 16.25, p < .001, such that interpersonal problems were predictive of lower overall eating style scores. At Step 4, anxiety explained an additional non-significant 2% of the variance in overall eating style scores, R^2 change = .02, F change (1, 163) = 3.17, p = .077. Therefore, anxiety was a non-significant predictor of overall eating style scores. At Step 5, depression explained an additional significant 6% of the variance in overall eating style scores, R^2 change = .08, F change (1, 162) = 14.81, p < .001, such that depression was predictive of overall eating style scores. In the final model, only social desirability, self-weighing and depression were statistically significant, with depression recording a higher beta value (β = -.35, p < .001) than self-weighing (β = -.19, p = .007) and social desirability (β = -.15, p = .03).

Discussion

The aim of this study was to investigate the interplay between eating styles in university students with depression, anxiety, interpersonal problems and self-weighing. The first hypothesis was supported. Lower eating styles total scores were significantly associated with higher scores of depression. Thus, this study suggests that university students who have higher depressive scores are significantly more likely to have an overall unhealthy eating style, than those with lower depressive scores. This finding is consistent with the multitude of research that has found a similar pattern between depression and emotional eating (Konttinen et al., 2010). This study's finding also supports the only known study that has explored the relationship between depression and overall eating style. While the study by Kuczmarski et al. (2010) indicated that people with depression were significantly more likely to have an overall unhealthy diet, the generalisability of the study's findings were questionable due to the researchers using dietary guidelines for Americans. The current study was able to expand upon this study's (2010) findings by examining whether depression predicted overall eating style by using the SESQ, a measure that took into consideration the diversity of eating among cultures.

The second hypothesis was not supported. Lower eating styles total scores were not associated

with significantly higher self-reported scores of anxiety. While correlation analysis indicated that a significant relationship existed between anxiety and overall eating style, when anxiety was placed into the HMR, after self-weighing and interpersonal problems, anxiety did not significantly predict overall eating style. The result is consistent with the findings of Bellisle et al. (1990), who found no significant relationship between anxiety and eating styles.

The third hypothesis was supported. Lower eating styles total scores were associated with significantly higher self-reported scores of interpersonal problems. This is the first known study that has looked at whether interpersonal problems contribute to overall eating styles. A person who is experiencing interpersonal problems may be more likely to have an unhealthy eating style. However, the present study did not examine whether particular ways of relating, such as domineering/controlling, or vindictive/self-centered predicted overall eating style. These are relationships that should be explored further.

The fourth hypothesis was also supported. Lower eating styles total scores were significantly associated with more frequent self-weighing. While research has begun to examine disordered eating, obesity, self-management and frequency of self-weighing, no known studies have looked at whether frequency of self-weighing in the general population contributes to overall eating styles. However, the present study's result is consistent with Neimark-Sztainer et al. (2006), who found an association between self-weighing and binge eating. The present study's findings found a significant negative relationship between frequency of self-weighing and overall eating style. The more frequently a person weighed herself, the less healthy her overall eating style. Self-weighing was also the only predictor, apart from depression that was still significant when depression, anxiety, interpersonal problems and self-weighing were accounted for in the HMR. This implies that frequency of self-weighing plays an important role in a person's overall eating style.

Finally, the fifth hypothesis that depression would account for more significant variance in total eating style scores, compared to anxiety, self-weighing and interpersonal problems in university students, was supported. This finding may be explained by the

Escape Theory (Heatherton & Baumeister, 1991), as depressed people may not want to deal with their depression and as a result they may begin to eat unhealthy foods. Until now, only one known study has examined the relationship between depression and overall eating styles (Kontinen, Mannisto, Sarlio-Lahteenkorva, Silventoinen, & Haukkala, 2010) and this study did not explore whether depression was a more influential predictor of eating compared to other known factors that influence a person's eating style.

While the results of this study are promising the experiment did have its limitations. Participants were university students, making the generalizability of the study questionable. Another issue of the experiment was that the data collected was based on self-reporting. Therefore, participants were required to remember particular information, such as how often they weighed themselves in the past month, or what they had eaten. As a result, participants' recollections may not have been precise. To improve reliability of the study, future research could conduct a longitudinal study that explores overall eating styles and the relationship between depression, anxiety, interpersonal problems and self-weighing.

Prior to this study there was little research that considered the role of depression in overall eating styles, no research that explored anxiety and overall eating styles and no research that considered the role of interpersonal problems and self-weighing in eating. This research demonstrated that depression, self-weighing, and interpersonal problems contribute to how a university student eats and therefore, whether a person has the potential to become overweight or obese. Hence, this study has helped to highlight areas that negatively affect a university student's overall eating style. While an interplay has been indicated between depression, interpersonal problems and self-weighing for overall eating styles in university students, future research should explore these relationships further by selecting participants from the general population, to determine whether an interplay exists in various communities. Eating styles are an aspect of obesity that needs to be understood to help increase knowledge and to enable appropriate interventions to be implemented. It is vital that every avenue is explored in the fight against obesity.

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