An Investigation into the Impact of Weight Loss on Self-Esteem and Body Satisfaction

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Acknowledgments

I would like to take this time to thank some individuals who have made this year a possibility for me with their continuous ongoing support and help throughout the year. I would first like to thank my lecturers in National College of Ireland who have constantly been there for all students, myself included as no question ever went unanswered. I would also like to thank my supportive friends and family as getting this far would not have been possible without their patience and support through it all.

To the participants who took part in this study, thank you for making it possible I am extremely grateful for every individual who took the time to answer my questionnaire.

Finally, I would like to extend my upmost gratitude to my supervisor, Michael Cleary-Gaffney for his continuous encouragement in final year and for also always lending an ear with the many panic moments I have had with the final year project, I would like to thank him for the guidance this past year as it has lead me to this submission.

Abstract

Aims – Obesity poses a huge threat in modern society, physical health issues are often a consequence however so are psychological issues. Research confirms this however self-esteem (SE) and body satisfaction (BS) issues can occur in individuals classified as a normal weight but still wish to lose weight. This study aims to investigate the role that weight loss plays in self-esteem and body satisfaction regardless of BMI.

Methods – 295 participants completed the Body Self-Esteem Scale and then the Rosenberg Self-Esteem Scale, this took approximately 10 minutes to adequately complete. Participants were categorised into three groups 1. No desire to lose weight (n = 81), 2. Attempting with a support group (n = 96) 3. Attempting without a support group (n = 118).

Results – Analysis, using ANOVAs, show that individuals with no desire to lose weight have higher body satisfaction than those attempting to lose weight while higher percentages of weight loss (with respect to the individual's goal) are correlated with higher levels of self-esteem and body satisfaction, thus proving hypotheses 2,5 and 6 true.

Discussion – Findings demonstrate that weight does in fact have an impact on self-esteem and body satisfaction while previous research along with limitations are also discussed.

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Introduction

1.1 Consequences of Obesity

The topic surrounding obesity has been researched extensively with research dating back decades and more recently, this is because obesity is a huge issue globally and, more specifically to this study, in Ireland. HSE statistical reports show that in 2018 60% of Irish adults and 20% of Irish children fell into the category of being overweight/obese with men more likely to carry extra weight compared to women while women are more likely to attempt to lose weight ("Key Facts" 2018). It is a modern interest in the field of psychology and medicine as it holds such a huge health threat today that sees various risks for overweight and obese individuals, these risks get more extreme and common with a higher BMI (Body Mass Index). Many of the risks attached to obesity revolve around physical health risks however there are also psychological health risks attached. An increased risk of cardiovascular disease, diabetes, cancer, sleep apnea are amongst many of the health risks associated with being overweight or obese (Pi-Sunyer, 2009; Skinner, Perrin, Moss & Skelton, 2015; Williams, Mesidor, Winters, Dubbert & Wyatt, 2015), these burdens that are related to being overweight or obese have been found is countless others studies. The prevalence of this and the health risks attached are alarming which is why lifestyles need to be changed to help combat this issue.

Having children is important to most women however being overweight/obese can cause infertility as it can negatively impact the reproductive system (Dag & Dilbaz, 2015; Talmore & Dunphy, 2015), this factor alone can cause psychological issues without the excess weight causing any which is why living a healthy lifestyle can prevent this from occurring while weight loss can reverse the consequences. As previously mentioned it has also correlated with psychological health risks, such as depression (Xiang & An, 2015) which brings its own string of possible issues if the situation doesn't improve. Psychiatric disorders are prevalent

in overweight and obese individuals, these disorders include agoraphobia, depressive disorder and panic disorder amongst many others (Simon et al., 2006). These disorders may lead to problems with completing everyday tasks and in extreme scenarios can make opportunities of employment or even leaving their home void.

1.2 Causes

The vast effects that being overweight/obese has on mental health will be discussed further with regards to other factors in this section. Obesity has become an epidemic in certain first world countries which could be linked to the readily availability of convenient fast food, processed food and junk food. Childhood obesity is a predictor of adulthood obesity (Llewellyn, Simmonds, Owen, & Woolacott, 2015). This is a worrying issue because children in this modern society should not be overweight with the level of general education this generation has on food and nutrition especially with all advertisements on televisions and social media, children who are overweight/obese don't get the opportunity to have an adequate childhood as their quality of life is significantly decreased compared to peers with a normal BMI (Schwimmer, 2003). Intervention in school systems should be introduced or more strictly enforced due to the prevalence of overweight children, parents should also intervene. Majority of the articles surrounding childhood obesity and obesity in general are designed around US participants due to the high prevalence of obesity in the US however these results may also be generalizable to Irish population as obesity is a major issue with rising statistics.

Studies show that obesity is more prevalent in poorer socioeconomic areas with poorer levels of education, these are risk factors for children and adults alike, results have been replicated in Ireland (Keane, Layte, Harrington, Kearney, & Perry, 2012) and internationally

(Bel-Serrat, et al., 2018). Certain medical issues such as thyroid problems (underacted thyroid) can be inherited which may also contribute to difficulty with losing weight.

1.3 Weight Loss Benefits

Research on health risks related to obesity has been studied extensively and continues to grow but similarly so does the research on the benefits of weight loss to individuals who are in the overweight or obese category. Benefits include reduction in mortality, blood pressure and glucose levels (Kritchevsky et al., 2015), other possible benefits which may not be discussed as much include less shortness of breath, more confidence, increased social life and other common everyday things that many individuals would take for granted. Much of the research is based around weight loss in obese or overweight people using an individual's BMI as an inclusion criteria, which is of great importance but isn't always the case. An individual does not necessarily need to be categorized as obese or overweight to feel self-conscious about their body, everyone has an ideology of what their perfect weight could or should be which is why this study is based around weight loss rather than solely with obese and overweight individuals.

1.4 Support Groups and Interventions

Support groups such as slimming world, weight watchers, slim for life etc, have become very popular amongst individuals striving to lose weight, these groups focus around motivating each other and eating 'on plan' food to achieve weight loss goals. Research has been done on weight loss groups to evaluate the benefits and results show that they have psychological benefits along with physical ones. Toon, Bennett, Avery, & Lavin (2019) found that significant weight loss was seen in a slimming world group post referral with continuous weight loss when patients continued the group after the initial recommended 12

weeks. Depressed mood decreased after 24-week involvement (Lemstra, Bird, Fox, & Moraros, 2018), these results were replicable as they coincided with those of Blaine, Rodman, & Newman (2007) where a decrease in depression was displayed with an improvement in self-esteem after weight loss. One study shows the positive effect that a community based support group had with weight loss amogst obese members (Nield & Kelly, 2016).

Slimming world has become the largest weight loss group in the UK and Ireland with around 900,000 members attending meetings each week ("All about Slimming World, the UK's favourite way to lose weight", 2019) this is without the sheer number of people who participate online and at home. Online group versions of weight watchers have become very popular and show positive results (Thomas, et al., 2017). The importance of these groups will be discussed in further detail in the following sections.

Evidence regarding how much support groups help compared to attempting weight loss without one is strongly focused around motivation and adherence rather than actual weight loss which is why this study will be investigating this as there is a gap in the research, motivation will be discussed further into this review of previous studies.

1.5 Body Satisfaction

Annesi and Porter (2014) found that body satisfaction improved in participants after weight loss. Intervention strategies and groups have also proven affective, higher weight loss in these groups have been linked with a greater improvement in body satisfaction when compared to peers who lost less (Palmeira, et al., 2009). Older research by Foster, Wadden, and Vogt (1997) support these conclusions as results show an increase in perception of body image, with participation in a weight loss treatment, after 24 weeks and 48 weeks retrospectively however they concluded that more research would need to be conducted to prove that these

results can be replicated solely from weight loss without other extrinsic factors. This was also an issue for Bas and Donmez (2009) as they could not conclude that an increase in body image was directly correlated with weight loss. When compared with people of normal weight, obese individuals had less body satisfaction, this study emphasizes the severity of this issue (Weinberger, Kersting, Riedel-Heller, & Luck-Sikorski, 2016). More research is needed so that results can be generalisable and reliable while a direct link can be established between weight loss and body image (body satisfaction).

1.6 Self-Esteem

Self-esteem is important to look at as it reflects how worthy a person deems themselves to be, low levels of self-esteem can have damaging consequences to an individual's confidence. Depression in adulthood has shown to be predicted by low, and continuously lowering, self-esteem in adolescents (Steiger, Allemand, Robins, & Fend, 2014). Low levels in an adolescent can also be a predictor of poor health and criminal behaviour in adulthood (Trzesniewski et al.,2006), many of these same authors found that lower levels of self-esteem are linked with delinquency, aggressive behaviour and antisocial behaviour (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005). Self-esteem levels have been linked to quality of life in specific individuals with schizophrenia (Wartelsteiner, et al., 2016) and in residential youth care (Jozefiak et al., 2017) results could possibly conclude that lower self-esteem is correlated with lower quality of life however more research needs to be conducted to isolate this factor and come to a reliable conclusion. Self-esteem levels have shown to improve after weight loss along with self-pride and self-respect (Stubbs et al., 2015) all linking together to show an improvement in the overall feeling of self-worth. Lower self-esteem was found to be associated with heavier weight individuals (Miller & Downey, 1999). Motivation, confidence and self-esteem improvements were seen in individuals who lost

weight with realistic weight loss goals (Ames et al., 2005) unrealistic goals may result in the individual becoming demotivated due to not reaching the unobtainable goals they wished for. Investigating the role of weight loss in self-esteem can have possible benefits with regards to improving and preventing issues like the ones mentioned above.

1.7 Motivation and Sustainability

Motivation to lose weight can be found in various ways and through various outlets, social norms which are deemed acceptable and desirable are amongst these reasons, this leads to extrinsic and superficial factors being prioritized such as physical appearances, immediate changes on the scale, wanting improved self-esteem amongst other factors. Physical factors are also desirable and play a role in motivation although it is less crucial, the number on the scale is what helps individuals continue their weight loss journey rather than quitting (Teixeira, Silva, Mata, Palmeira, & Markland, 2012). People need be aware that loses are not guaranteed every week as uncontrollable factors can appear (e.g. menstrual cycle, muscle gain), individuals need to accept this so they don't give up on the process.

Weight loss groups intend to educate their members on what foods to eat and avoid while also teaching balance without complete restriction, they also aim to motivate each other as a collective group. Motivation is key in weight loss groups because regardless of whether a member has a loss or a gain they motivate, they applaud weight loss and try find out why weight gain occurred while encouraging the member to get back on plan. Motivation can be a powerful tool in adherence to weight loss programmes which is why weight loss groups are a topic of interest in this study. Motivation of these groups can also be seen in online groups with studies showing their effectiveness (Hwang, et al., 2010; Jane, et al., 2017).

Although weight loss can improve psychological issues, as mentioned above, it should not be the first answer for certain issues. Individuals need to seek appropriate specialists to help

with these issues and weight loss should only be used in aid of these, weight loss can improve these issues while exercise releases endorphins that may also help (Balchin, Linde, Blackhurst, Rauch, & Schönbächler, 2016). It is also important that individuals attempt weight loss for the right reasons and do so in a healthy appropriate manner, normal weight individuals (indicated by BMI) should not be attempting to lose vast amounts of weight as it could be unhealthy for them and may cause eating disorders and other mental health issues while obese/overweight participants should not use quick diets as a way of losing weight because this too is unhealthy and could cause eating disorders or mental health issues along with the possibility of malnutrition. People's mental health can be heavily affected which is why social media and social norms of how one should look can be so damaging, the latest celebrity diet will be posted everywhere which are never healthy or sustainable yet they are so common, this puts pressure on individuals to follow a certain diet and look a specific way. Every human needs a certain amount of nutrition to survive and complete day to day tasks which is why adequate meal plans and exercise regimes need to be put in place suit the individual's needs and goals. These regimes are more sustainable in the long run as they are realistic and not a one size fits all diet, individual's need a lifestyle change rather than a diet or quick fix weight loss plan. One study uses adherence to behavioural and physiological routines to help maintain weight loss as this is what they found most affective (Maclean, et al., 2014), adherence to any aspect of a weight loss plan is of importance because if an individual does not stick to it then desired results won't be seen.

Rationale

Psychological issues have been demonstrated in individuals who want to lose weight since they gain motivation from how they wish they looked and how dissatisfied they are with their bodies. Losing weight may be helpful in gaining better self-esteem levels and body

satisfaction as being overweight or obese typically sees decreases in these areas, this is the rationale as to why a correlation is expected between weight loss and increased self-esteem with improved body satisfaction. This study will look at individuals in a weight loss group compared to those trying to lose weight without the support of a group to see if groups equate better weight loss and improvements since they usually have more motivation with their group while also being educated in groups on food and portions. This will be looked at since comparing these groups together, especially with the following factors, has not been investigated as a collective topic. Most studies surrounding self-esteem and body satisfaction look at just weight loss in groups or weight loss without support of a group, rarely the two together which is why this study is using these groups specifically. Research using comparison of both body satisfaction and self-esteem as a collective topic is also scarce which is why this study will investigate it. Females will be the focus of this study as more support groups tend to be predominately unequal gender wise with majority of members being female, they are more like to go to groups and see the support of these said groups.

How people see themselves are typically how they feel about themselves so not every individual who is overweight (BMI 30 or more) will feel bad about themselves just as how not every individual of normal weight will feel good about themselves. As seen above losing more weight loss equates better body satisfaction (Palmeria et al., 2009) however each individual goal is different so a 10 pounds' loss for one person will give them confidence while it may only be the start and a small percentage of a goal for another so it's possible that this weight loss could increase body satisfaction for one and keep the level the same for another. This study, unlike many of the others, will ask participants how much weight they have lost with respect to how much they intend to lose so that the percentage of their goal can be calculated and compared to body satisfaction and self-esteems levels. Fortunately, since this generation is more educated, it is hoped that more people live a healthy lifestyle and

engage in lifestyle changes to decrease weight and maintain it rather than rapid weight loss that is not maintainable. If the hypothesis is accepted this research can be beneficial towards educating individuals who wish to lose weight and who experience body dissatisfaction or low self-esteem levels, they will be able to understand that losing weight can help them physically and mentally. Obesity is a huge health epidemic and certain interventions need to be put in place to prevent this from growing. This study will help fill a research gap on body satisfaction and self-esteem, separate and collectively, in weight loss groups when compared to those trying to lose weight without such support and those not wishing to lose weight.

Aims/Objectives

The aim of this study is to investigate the impact that weight loss has on self-esteem and body satisfaction. It is hypothesised that individuals attempting to lose weight (with or without a support group) will have lower levels of self-esteem when compared to individuals who have no desire to lose weight (hypothesis 1) as will levels of body satisfaction (hypothesis 2). The aim of this study is also to investigate if membership of a support group has improved levels compared to those individuals who are attempting to lose weight with no engagement in a support group (hypothesis 3 & 4). It is hypothesised that self-esteem will be lower in individuals who have only lost a small percentage of their goals, versus individuals with a higher percentage loss, therefore it is predicted that larger percentages of weight loss will bring a greater improvement in body satisfaction (hypothesis 5), greater improvements in body satisfaction levels is also hypothesised with a greater percentage of weight loss (hypothesis 6). The objective is that individuals will have more education on the consequences of obesity while also knowing the benefits of weight loss and a healthy lifestyle.

Methods

2.1 Participants

The questionnaire for this study was online therefore the participants were also recruited online in various ways, including social media sites. The sample was accumulated from a population of adult females and males who are attempting to lose weight (i) without support of a group (ii) with support of a group, and individuals who have no desire to lose weight. The methods of sampling used were convenience and snowball sampling which ensured that no biases occurred during the process. The sample (n=295) was predominately made up of females (85%, n = 250) with a mean age of 29 years (SD=12.25**,** Range = 18-77). Majority of participants were in the category of attempting to lose weight without support from a weight loss group (40%, n = 118), while the rest of the participants had no desire to lose weight (27%, n = 81) or were a member of a weight loss group (33%, n = 96). The mean weight lost was 19 pounds (SD=26.33, Range = 0-141) while the mean weight intended to lose was 46 pounds (SD=35.39, Range= 5-208).

Thirty-Four participants were eliminated (in excel) from this study due to not adequately responding to certain questions therefore making their responses void. Participants were excluded if they were under 18 to avoid ethical concerns.

Table 1.

Frequencies

Variable	Frequency	Valid Percentage
Gender		
Male	45	15.3
Female	250	84.7
Category		

Support Group	96	32.5
No Support Group	118	40
No Desire	81	27.5

Note N=295. Support Group= Participants in a support group to aid in weight loss. No Support Group= Attempting weight loss without a group. No desire= No desire to lose weight.

2.2 Measures/Materials

Firstly, a debriefing sheet, containing all information concerning the study, and a consent form was provided at the beginning of the study. These included the topic, rights of the participant (confidentiality), possible risks to the participant and contact information of the researcher, supervisor and contacts that may be needed to aid with any discomfort caused by participation (*see appendix A*) along with a consent sheet (*see appendix B*). A demographics sheet was then used where participants were presented with questions like 1. Gender, 2. Age, 3. Category (- weight loss group -attempting to lose weight without group -no desire to lose weight) 4. If attempting to lose weight how much have they lost, 5. How much weight they intend to lose (*see appendix C*).

The Body Self-Esteem Scale (Franzoi & Shields, 1984) is a self-report questionnaire which measures the levels of body satisfaction amongst individuals with questions surrounding specific body parts or characteristic, there are few scales that measure body self-esteem however this one seemed most appropriate for this study. Participants are asked to rate each one individually from 1 (indicating strong negative feelings) to 5 (indicating strong positive feelings). This scale originally uses subscales for gender specific questions however in the instances of this study it was adapted, for participant convenience, and gender specific questions were formed into one generalized question. The adaption is a 32-item scale rather than a 35-item scale and it was presented in a Likert scale format. Lower scores express lower self-esteem and vice versa with scores ranging from 32-160. The reliability and

validity of this scale was tested and approved (Franzoi, 1994) with a Cronbach's Alpha score of .80-.89 (Lipowska & Lipowski, 2013) which is why it has been used in many studies since it was first established, this review also shows correlations with the Rosenberg Self-Esteem Scale which is why both are used simultaneously in the current study (*see appendix D*).

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) will be used to measure self-esteem across the three categories. This is a ten-item scale with a combination of five statements worded positively and five statements worded negatively, questions intend to give an overall score with statements like "I feel that I have a number of good qualities", a positive worded statement, or "I feel I do not have much to be proud of", a negative worded statement. Responses range from strongly agree to strongly disagree with four possible answers. If participants have an overall score below 15 it may suggest that there is an issue with lower self-esteem, scoring between 15-25 indicates normal levels of self-esteem. This measure is widely used with several translations available, it was examined for reliability and found that test-retest reliability was high while internal consistency was also ranging between .77 and .88 (Rosenberg, 1965) indicating good reliability and validity with a Cronbach's Alpha score of .86 (Vermillion & Dodder, 2007), (*see appendix E*).

2.3 Procedures

Participants for categories (i) no desire to lose weight, and (ii) attempting to lose weight without support from a weight loss group were gathered by posting the questionnaire online generally to a personal Facebook/Twitter account while participants for the category (iii) attempting to lose weight with the support of a group were gathered through public weight loss groups on Facebook (Weight watchers, slimming world, slim for life etc). Public groups were chosen as they are popular for motivating individuals in support groups therefore a vast

number of individuals are involved with these online pages, it also avoided any ethical requirements of permission as these groups are open to anybody to post.

A link was posted which interested individuals clicked and were provided with information regarding the study and what their involvement entailed. Participants were made aware that they could not withdraw from this study once they submitted their questionnaire as all responses would be gathered anonymously with a participant ID given to each individual participant (1^{st} participant = 1, 2^{nd} = 2 and so on) making it impossible to remove any given person. When informed consent was provided the participants were then brought to the beginning of the questionnaire (Demographics) and asked to complete all questions and sections as they were all mandatory. Information on how to answer the questionnaires was produced and participants were provided with two questionnaires which were self-report scales ranging from 1-5 and 1-4 retrospectively, participants had to verify their participation by giving their consent though the submission of their responses at the end of the final section. Measures used will be discussed in more detail within the following section.

It took participants around 10 minutes to adequately answer all sections, responses were gathered over a 6-week period until the desired number of participants was obtained, the questionnaire then closed and ceased collecting responses.

2.4 Design

The research design of the present study is correlational and cross-sectional. It is an observational study where inferences will be made from data compiled using a sample from the target population. The independent variable across the present studies' hypotheses is weight loss support groups on two levels of either a member or non-member but still attempting weight loss while self-esteem and body satisfaction are the dependent variables.

Data was analysed using various methods of descriptive statistics and inferential statistics. Firstly, frequencies and descriptives were run with regards to the general data to get an overview, descriptives was run twice, once with split file for weight loss groups and once without. Cronbach's Alpha and Kolmogorov-Smirnov were used to test the reliability and test-retest of the measures used. Inferential statistics were conducted to examine the differences between groups, three one-way between groups ANOVAs were conducted to investigate the differences in self-esteem scores and body satisfaction scores with regards to 1. Weight loss category, 2. Age 3. Percentage of weight lost. Post Hoc analyses were also conducted to examine exactly where these differences lie between groups. Hierarchical regressions were run to test whether dependent variable variance could be a consequence of the other variables involved in this data set for the present study.

Results

3.1 Descriptive Statistics

The mean, standard deviations and range of all the continuous variables in the present study were measured using descriptive statistics, the variables involved in this process were age, weight loss (already lost), weight intended to lose (goal weight loss), percentage weight (% of goal lost prior to completing the survey), total self-esteem score and total body satisfaction score. Split file was enforced to firstly run descriptive statistics within the three categories, category a) In a support group (n=96), b) Attempting weight loss without group (n=118), c) No desire to lose weight (N=81). These results, *as shown in table 1 below,* show that participants in Group A had a higher mean for various factors (Age=35.57, WeightLoss=29.05, IntendedLoss=69.01, PercentageWeight=42.99) when compared to Group B (Age=27.76, WeightLoss=10.70, IntendedLoss=32.05, PercentageWeight=32.05). The mean scores of both total self-esteem and total body satisfaction were similar in both groups with a slightly higher score in Group B, the mean score for self-esteem in Group A (M=17) was lower, not significantly, when compared to Group B (M=17.18), the mean score for body satisfaction was also slightly lower in Group A (M=93.89) compared to Group B (M=94.58) however once again it is not a significant difference. Mean scores for Group C were not significantly higher, only slightly than both A with regards to self-esteem scores (M=17.68) although it was significantly higher in body satisfaction (M=105.10). These results, *as shown in table 1 below,* could possibly indicate that there was no significant difference between the three groups in self-esteem scores while higher body satisfaction could possibly be attributed with no desire to lose weight indicating that individuals who do not wish to lose weight have more confidence in their body.

Table 1.

Descriptive Statistics (Split File)

Category		Minimum	Maximum	Mean	SD	N
Support Group	Age	18	77	35.40	13.57	96
	Weight Loss (lbs.)	0	125	29.05	27.74	96
	Intended Loss (lbs.)	14	208	69.01	36.65	96
	% Weight Lost	0	120	42.99	31.92	96
	Total Self Esteem	0	30	17.00	8.11	96
	Total Body Satisfaction	53	160	93.89	27.46	96
No Support	Age	18	65	27.76	11.52	118
	Weight Loss (lbs.)	0	101	10.70	15.35	118
	Intended Loss (lbs.)	7	140	32.14	23.93	118
	% Weight Lost	0	100	32.05	28.41	118
	Total Self Esteem	4	29	17.18	6.64	118
	Total Body Satisfaction	48	154	94.58	21.24	118
No Desire	Age	18	62	23.58	7.57	81
	Weight Loss (lbs.)	-	-	-	-	-
	Intended Loss (lbs.)	-	-	-	-	-
	% Weight Lost	-	-	-	-	-
	Total Self Esteem	3	29	17.68	6.84	81
	Total Body Satisfaction	43	160	105.10	25.46	81

Note N=295. Support Group= Participants in a support group to aid in weight loss, No Support = Attempting weight loss without a group, No desire= No desire to lose weight. Weight Loss= Weight already lost prior to study, Intended Loss= Overall weight loss goal, % Weight Lost= Percentage of goal lost prior to study.

Ages within the 295 participants varied with a range of 18-77 (M=291, SD=12.25), total self-esteem scores ranged from 0-30 (M=17.26, SD=7.18) while total body satisfaction scores ranged from 43-160 (M=97.24, SD=24.96) the means for both total scores are in moderate ranges. The other variables were measured using less participants (N=214) since some participants were excluded due to being in group B, WeightLost ranged from 0-125 (M=18.93, SD=23.58), IntendedLoss ranged from 7-208 (M=48.68, SD=35.38), PercentageWeight ranged from 0-120 (M=36.96, SD=30.45). *Results shown in table 2 below.*

Table 2.

Descriptive Statistics

	Minimum	Maximum	Mean	Mean Std. Error	SD
Age	18	77	29.10	.71	12.25
Weight Lost (lbs.)	0	125	18.93	1.61	23.58
Intended Loss (lbs.)	7	208	48.68	2.42	35.38
% Weight Lost	0	120	36.96	2.08	30.45
Total Self Esteem	0	30	17.26	.42	7.18
Total Body Satisfaction	43	160	97.24	1.45	24.96

Note. N=295. Weight Loss= Weight already lost prior to study, Intended Loss= Overall weight loss goal, % Weight Lost = Percentage of goal lost prior to study. Total Self Esteem = Total scores for Self Esteem responses, Total Body Satisfaction = Total scores for Body Satisfaction responses.

Results from a Kolmogorov-Smirnov test showed demonstrated results were non-normally distributed for both total self-esteem and total body satisfaction ($P < .05$). Reliability for the two scales were tested with regards to Cronbach's Alpha, the Body Self-Esteem Scale was shown to have high internal consistency (a=.953), *as shown in table 3*, while the Rosenberg

Self-Esteem Scale also showed high internal consistency (a=.889) *as shown in table 4*. These scores indicate that test-retest scores are high thus making the scales reliable and efficient for the present study.

Table 3.

Body Self-Esteem Scale (Body Satisfaction) reliability

	Cronbach's Alpha	No. of Items
Body Satisfaction Scale	.953	32

Note. N=295

Table 4.

Self-Esteem Scale reliability

	Cronbach's Alpha	No. of Items
Self-Esteem Scale	.889	10

Note. N=295

3.2 Inferential Statistics

A one-way analysis of variance (ANOVA) was run to investigate the differences in the three weight loss group categories with regards to self-esteem and body satisfaction. Participants were grouped based on their response regarding membership of weight loss groups, Group 1: Attempting weight loss with a support group, Group 2: Attempting to lose weight without a support group, Group 3: No desire to lose weight. ANOVA results show that there is no significant difference between the three groups when looking at self-esteem scores (F (2, 292) = .207, p = .813). The post hoc comparisons with Tukey HSD also show that there are no statistically significant differences between groups ((Support group – No group, p = .982),

(Support group – No desire, p = .807), (No group – No desire, p = .880)), *results shown in table 5 & 6 below.*

A subsequent one-way ANOVA was conducted with regards to body satisfaction scores, there was a statistically significant difference between groups (F (2, 292) = 5.728, p = .004). The post hoc comparisons with Tukey HSD demonstrate where these differences between groups are with body satisfaction scores, 1) In a support group showed no significant differences with 2) Attempting to lose weight (p = .977) while 3) No desire to lose weight showed statistically significant differences with Group 1 (p = .008) and with Group 2 (p = .009). These results confirm the results of descriptive statistics which show that there are no differences between categories with regards to self-esteem scores however there is a statistically significant difference in body satisfaction scores. This difference is solely demonstrated in the category who have no desire to lose weight, *as shown in figure 1,* therefore the results show that people who are happy with their weight (do not wish to lose any) are also happier with their body. *Results shown in table 5 & 6 below.* The variance within the support group category for both self-esteem scores and body satisfaction scores were more varied compared to the others, this variance could explain the inferential results and may be the consequence of having more variance with regards to percentage of weight lost with respect to their goal. This variance is shown within Std. Deviation scores, *as seen below in table 5*

Figure 1. *Differences between groups.*

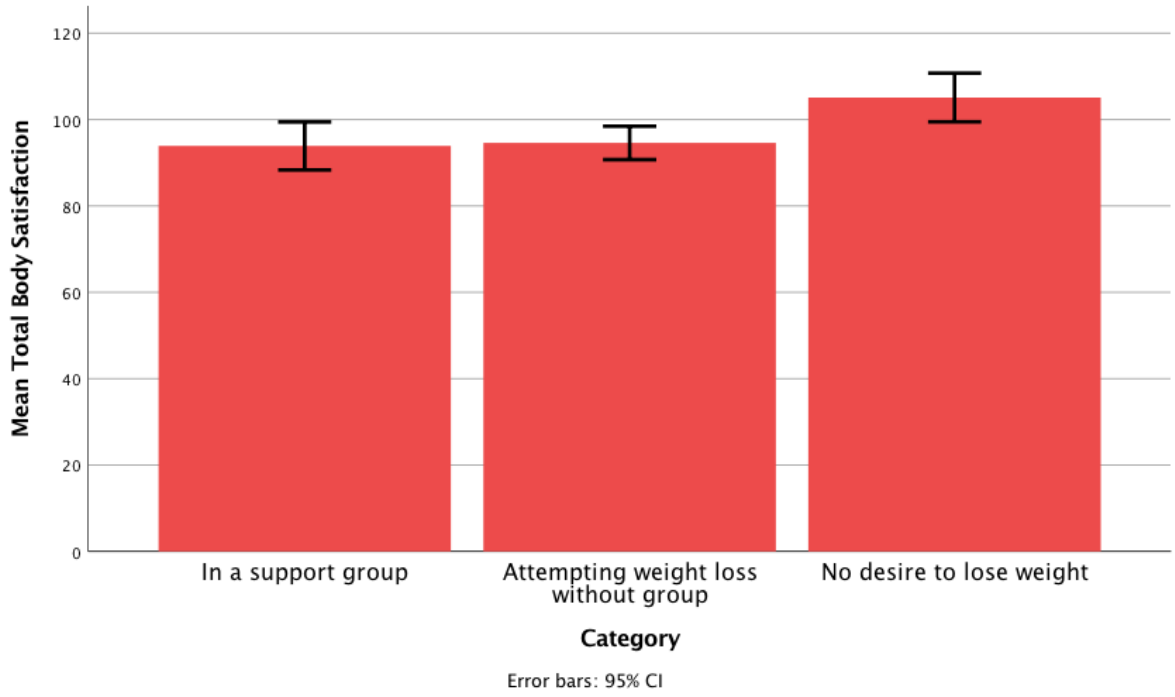

Table 5.

Descriptive Statistics for One-Way ANOVA for scale scores

		N	Mean	Std. Deviation	Range
Total Self Esteem	Support Group	96	17.00	8.11	0-30
	No Group	118	17.18	6.64	4-29
	No Desire	81	17.68	6.84	3-29
Total Body Satisfaction	Support Group	96	93.89	27.46	53-160
	No Group	118	94.58	21.24	48-154
	No Desire	81	105.10	25.46	43-160

Note N=295. Support Group= Participants in a support group to aid in weight loss, No Group= Attempting weight loss without a group, No desire= No desire to lose weight.

Table 6.

Results for one-way between group ANOVA

	Df	Mean Square	F	Sig.
Total Self Esteem	2	10.75	.207	.813
Total Body Satisfaction	2	3457.41	5.73	.004

Note N=295.

A one-way ANOVA was conducted to investigate the difference between total self-esteem and body satisfaction scores between age groups. Participants were split into four groups based on their age, Group 1 = 18-30, Group 2 = 31-40, Group 3 = 41-50, Group 4 = 51-71. Anova results regarding self-esteem scores display that there is a statistically significant difference between the four groups (F (3, 290) = 5.568, p = .001). The mean score of each group increased as age group increased ((18-30, M = 16.19), (31-40, M = 18.13), (41-50, M = 19.67), (51-71, M = 21.42)) indicating that self-esteem improves with age. Post-hoc comparisons using Tukey HSD demonstrate where these statistically significant differences between groups are with self-esteem scores, the sole statistically significant difference was between ages 51-71 and 18-30 (p = .003) while the others were not significant (p > .005). *Results shown on tables 7 & 8.*

A one-way ANOVA was conducted to investigate the difference between total body satisfaction scores between age groups. ANOVA results determined that there were no statistically significant differences between the four groups (F (3, 290) = .667, p = .567). Post-hoc comparisons using Tukey HSD showed that there were no significant differences between groups (p > .005). Mean scores for these groups show that ages 18-30 (M = 98.30) and ages 51-71 (M = 97.96) have higher scores for body satisfaction while ages 31-40 (M = 95.77) and ages 41-50 (M = 91.00) were lower, these results indicate that the lower age group and the higher age group have improved body satisfaction. *Results shown on tables 7 & 8.*

Table 7.

Descriptives Statistics for one way ANOVA for age

	Age Category	N	Mean	Std. Deviation	Range
Total Self Esteem	18-30	198	16.19	6.76	3-30
	31-40	48	18.13	7.28	4-29
	41-50	24	19.67	7.13	0-29
	51-71	24	21.42	8.10	1-30
Total Body Satisfaction	18-30	198	98.30	23.39	48-160
	31-40	48	95.77	26.90	54-153
	41-50	24	91.00	25.73	48-148
	51-71	24	97.96	33.06	43-160

Note N=295.

Table 8.

Results for one-way between group ANOVA

	Df	Mean Square	F	Sig
Total Self Esteem	3	272.33	5.57	.001
Total Body Satisfaction	3	424.68	.677	.567

Note N=295.

A one-way ANOVA was conducted to investigate the difference between total self-esteem and body satisfaction scores between percentage of weight lost groups. Participants were categorized into three groups based on how much weight they lost respective to their goal, Group 1 = 0%, Group 2 = 1-50%, Group 3 = 51-100%. Anova results regarding the self-esteem scores display that there is a statistically significant difference between the three groups ($F(2, 210) = 24.981$, $p < .001$). The mean score of each group increased as percentage

of weight lost increased ((0%, M = 14.32), (1-50%, M = 15.06), (50-100%, M = 21.92)), indicating that self-esteem improves with the percentage of their personal goal that individuals have lost. Post-hoc comparisons using Tukey HSD demonstrate where these statistically significant differences between groups are with self-esteem scores, the statistically significant differences were found between 0% and 51-100% ($p < .001$) and 1-50% and 51-100% ($p < .001$) while the final comparison between 0% and 1-50% was not significant ($p > .005$). *Results shown on tables 9 & 10.*

A one-way ANOVA was conducted to investigate the difference between total body body satisfaction scores between percentage of weight lost groups. Anova results regarding body satisfaction scores illustrate that there is a statistically significant difference between the three groups ($F (2, 210) = 95.281$, $p < .001$). The mean score of groups decreased in the second group and then increased significantly in the third group as percentage of weight lost increased ((0%, M = 83.26), (1-50%, M = 83.22), (50-100%, M = 119.14)), indicating that body satisfaction improves with a higher percentage that individuals have lost. Post-hoc comparisons using Tukey HSD demonstrate where these statistically significant differences between groups are with body satisfaction scores, the statistically significant differences were displayed between 0% and 51-100% ($p < .001$) and 1-50% and 51-100% ($p < .001$) while the final comparison between 0% and 1-50% was not significant ($p > .005$). *Results shown on tables 9 & 10.*

Table 9.

Descriptives Statistics for one way ANOVA for Percentage of Weight Lost

	% Category	N	Mean	Std. Deviation	Range
Total Self Esteem	0	19	14.32	4.80	7-24
	1-50	130	15.06	7.01	0-29

	51-100	64	21.92	6.15	8-30
Total Body Satisfaction	0	19	83.26	10.37	58-99
	1-50	130	83.22	16.41	48-124
	51-100	64	119.14	20.70	74-160

Note N=213.

Table 10.

Results for one-way between group ANOVA

	Df	Mean Square	F	Sig
Total Self Esteem	2	1087.55	24.98	.000
Total Body Satisfaction		28880.79	95.28	.000

Note N=213.

A hierarchical multiple regression was conducted to predict body satisfaction when assessing the ability to control for two measures (percentage of weight goal lost, self-esteem) after controlling for the influence of age. Preliminary analyses ensured that there was no violation of assumptions within normality, multicollinearity and homoscedasticity. Age was entered in Step 1 and explained 5% of variance in body satisfaction. Percent category (Percentage of weight goal lost) was entered in Step 2 bringing the total variance explained up to 62%. Total self-esteem was inputted in Step 3 thus increasing the total variance explained to 75%, F (3, 209) = 87.074, $p < .001$. The controlled measures additionally explained 17% of variance in body satisfaction when controlling for age, R Square Change = .116, F change (1, 209) = 77.884, $p < .001$. In the final step, all three variables were statistically significant ($p < .001$) with the percent category showing a higher beta value (*beta* = .462, $p < .001$) than the total self-esteem category (*beta* = .453, $p < .001$) and the age category (*beta* = -.232, $p < .001$). These results, *as shown in table 11*, show that the percent

category (weight lost with regards to overall goal) was the greatest predictor of body satisfaction.

Table 11.

Hierarchical multiple regression results predicting body satisfaction scores

Model		B	SE	B	Sig
1	Age	-.11	.14	-.05	.436
2	Age	-.30	.11	-.15	.007*
	Percent Category	26.68	2.31	.63	.000***
3	Age	-.47	.10	-.23	.000***
	Percent Category	19.57	2.14	.46	.000***
	Total Self Esteem	1.57	.18	.45	.000***

Note: B = Unstandardized beta value, SE = standard error B, β = Standardized beta value (variance explained), Statistical significance * $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

This study investigated the role that weight loss plays with regards to self-esteem and body satisfaction, the possible correlation of the these were examined.

4.1 Interpreting Results

The first hypothesis, that individuals with no desire to lose weight would have higher levels of self-esteem, was rejected. This was demonstrated using a one-way Anova (Table 5), no significant difference was found between the groups as the increase was miniscule (Table 6). Individuals with no desire to lose weight did however have increased levels of body satisfaction when compared to those attempting to lose weight, hypothesis two was accepted. This was shown using a one-way Anova (Figure 1 & Table 5) where the increase can be seen with a significant difference between groups (Table 6).

Previous studies have found that self-esteem in intervention groups are complex and may be the consequence of other external factors such as gender, parental feeding, bullying etc (Lowry et al., 2007) however the findings in this review study are from a collection of journals with samples consisting of pediatric overweight individuals rather than adults. This is the case for many studies as this topic tends to be associated with adolescents, possibly in prevention or predicting future obesity and self-esteem problems. Liu, Wu and Ming (2015) found no significant difference in self-esteem levels between intervention groups and control groups, these results were also found in other studies (Rubinstein, 2006) which is consistent with the findings of this study. However, results from other studies show opposite results with higher self-esteem in intervention groups compared to individuals not actively attempting to lose weight (Foster et al., 1985; Mellin, Slinkard, & Irwin, 1987).

Body satisfaction had higher improvements in an intervention group compared to a control group (Neumark-Sztainer et al., 2010), however it was not concluded which group had an overall higher satisfaction at the end. Hausenblas & Fallon (2006) conducted a meta-analysis and found that exercise interventions have higher body satisfaction post-intervention when compared to the control group of non-exercisers. Body satisfaction was found to be lower in normal weight individuals compared to obese individuals (Bacevičienė, Rėklaitienė & Tamošiūnas, 2009), these results have been replicated in many other studies (Streeter, Milhausen & Buchholz, 2012; Herbozo, Menzel & Thompson, 2013; Fallon, Harris & Johnson, 2014), these findings can possibly be attributed to hypothesis 2 even though it isn't the exact same statement as literature is limited.

Self-esteem and body satisfaction showed no significant differences between participants in a support group and participants attempting to lose weight on their own without membership of a support group thus proving hypothesis three and four untrue (Table 5). Unfortunately, literature on these hypotheses are scarce and results are inconsistent with each other and the results of the present study. Rubinstein (2006) found that individuals attempting to lose weight without a support group have lower self-esteem than those in a group. Cameron (1999) concluded that self-esteem was higher in the control group compared to the intervention/support group, this study did use a sample of children however as the research is limited it is used to compare literature to the current study's results. Other studies using a non-adult sample found similar results with groups showing improved self-esteem (Stoner & Fiorillo, 1976; Walker, Gately, Bewick, & Hill, 2003)

When compared to intervention groups, control groups (attempting to lose weight without support) had less weight loss (Haapala et al., 2009) which infers a higher body satisfaction based on the results for hypothesis 6 of the present study (*see discussion below*) that higher weight loss leads to increased body satisfaction.

These hypotheses may have been rejected due to the variance within the groups based on the percentage of weight loss. These variances were controlled for in the final two hypotheses where percentage of weight loss, with respect to the overall goal, was categorized and compared to self-esteem and body satisfaction. Hypothesis 5, that self-esteem levels will be greater with a higher percentage of weight lost, was accepted (Tables 9 & 10). Hypothesis 6, that body satisfaction would improve with a greater percentage lost, was also found to be true (Tables 9 & 10). These results suggest that individuals who are closer to their goal weight or at their goal weight have more self-esteem and body satisfaction compared to individuals who have more to lose.

These results were consistent with those found within past research, longitudinal studies will be discussed as this would have been a more suitable method of data collection as it measures from beginning to end. One study reports that self-esteem levels increase from the start of a weight loss intervention compared to the final measures (McGregor, McKenna, Gately & Hill, 2016), this would be equivalent to comparing lower weight loss percentage to higher percentages. Stubbs (2015) concluded similar results to the present study with increased self-esteem levels amongst participants who have reached their weight goal. These longitudinal intervention studies have been consistent for self-esteem but also body satisfaction with more positive levels being reported (Huang, Norman, Zabinski, Calfas & Patrick, 2007) this is true with the results of the present study. Body image, or body satisfaction, has demonstrated improvements when participants lost a significant amount with respect to their weight goal (Annesi & Porter, 2015). Looking at the differences in bariatric patients' pre-surgery and after weight loss is also another idealistic way of looking at these hypotheses, improvements in body satisfaction has been found in these studies (Madan, Beech & Tichansky, 2008; Teufel et al., 2012; El-Matbouly et al., 2017) as has increased levels of self-esteem (Burgmer et al., 2007; Burgmer et al., 2014)

Older research confirms these results, Sherman et al. (1992) found self-esteem levels (using the Rosenberg scale) increased during a weight loss intervention program with these same results also being presented in an older study (Foster, Wadden & Brownell, 1985). Body S satisfaction (body image) was also researched in older studies and results are consistent to these present results as they show that levels improve with weight loss (Foster, Wadden & Vogt, 1997).

An Anova was used to explore the differences across different age groups and found that self-esteem levels increased as age did while body satisfaction levels were greater in the youngest and oldest age category (Table 7 & 8). It should be noted that self-esteem levels may be classed as problematic if the individual scores under 15 on the scale, the mean score was only under this, or close to it, in the lower percentage category (those who are further away from their goal). It should also be noted that when controlled for, using a hierarchical regression, percentage of goal achieved was the biggest predictor of body satisfaction (Table 11)

4.2 Limitations

The present study, like many others, encountered limitations that may have had an impact on the results. The measures used were self-reported which can pose a threat to the validity and reliability of the results although these measures were inspected for internal reliability and have proven beneficial to this study (cost effective, time efficient) however they can also be a limitation to studies such as the present one. These measures rely on honesty from the participant however it is not possible to know whether an individual was compelled to exaggerate or underplay their scores on the scales, response biases occur when participants respond to a question irrespective of how they feel. The chosen scales were used as they were less complex to understand however some questions may have been harder to understand

based on the participant, without the researcher at hand they are less likely to ask for help with interpreting the question and answer randomly.

These results were based on a cross-sectional design with the data being analysed at one point in time, unfortunately this was the most appropriate design for this study due to time restrictions. A longitudinal study would have been better suited providing more accurate and reliable results, this would have been achieved by measuring body satisfaction and self-esteem within a sample who are attempting to lose weight. Their levels would be first measured at the beginning or their journey and constantly monitored throughout. This design has been proven efficient while looking at self-esteem and body satisfaction (O'Dea, 2006; McGregor, McKenna, Gately & Hill, 2016; Bucchianeri, Arikian, Hannan, Eisenberg & Neumark-Sztainer, 2013). An attempt to control for this limitation was made in Hypothesis 5 and 6 by calculating how far an individual has come with respect to their goal.

There is an inconsistency within the sample with regards to age and gender, a more equal split along with a bigger sample would help the accuracy of results while aiding with reducing biases based on a larger sample. A more equivocal sample is needed amongst the percentage of weight lost category as inconsistencies could lead to variance within the groups. Another limitation is that this population consists of Irish participants only, meaning that the results are only generalisable to one specific region therefore future studies would need to use a more diverse sample with respect to regions and ethnicity. It would be suggested that they use a non-pediatric population as majority of the past research on these use a sample of children and adolescents, making them ungeneralizable to the adult population. Another recommendation for future studies would be to add a question to the demographics asking participants how long they have been attempting to lose weight to see if time correlates with more weight loss and adherence.

4.3 Strengths

Despite the limitations this study also includes many factors which strengthens the study, it may have a beneficial contribution to psychology with the findings it presents. The hypotheses are also helpful with little to no research or findings for some, this is a crucial factor as new studies are invaluable to psychology with respect to the advancement of knowledge within such topics and aids in broadening the research field.

Some hypotheses in the present study have scarce literature available, these topics having little to no research on them is a limitation when citing similar findings however it is a strength with regards to the psychological community as new research questions are always evolving and they are beneficial to the advancement of knowledge. They ensure that topics and their findings are representative of a broader population carrying accurate and valid results which can be used when citing in future studies rather than using outdated or unrelated studies.

This then brings us to the implications of this study because of these strengths, obesity is a huge issue which can lead to many physical health issues as well as psychological issues, as discussed previously. This study provides important findings and up to date literature supporting the issues of this topic, identifying ways to help lessen this will in turn help body satisfaction and self-esteem issues amongst other issues.

It may also help target populations who are most at risk of developing obesity or risky levels of self-esteem and body satisfaction, once these possible populations are identified then interventions and treatments can be implemented to either help lessen the effects of the consequences attached or aid in avoiding them completely.

4.4 Conclusion

In conclusion, these results confirm the notion that weight does in fact have an impact on self-esteem and body satisfaction thus confirming that weight loss plays a role in both. Results of the present study demonstrated that body satisfaction is higher amongst individuals who have no desire to lose weight while higher percentages of weight loss, with respect to their goal, is correlated with increased self-esteem and body satisfaction. The mixed results from previous studies highlight the importance of future studies as all have had their limitations therefore further studying of these topics will help form a definite conclusion which can have positive implications for psychology.

With the consideration of the limitations discussed, this study could have more accurate results. Further research is needed to control for external factor such as environmental and social while using a more representative sample is of importance as most research discussed in this section was not adult focused.

This study highlights the important role that weight, specifically being overweight or obese, has on self-esteem and body satisfaction levels which can have negative effects. Thus, this study has implications for the advancement of knowledge in psychology and could be beneficial in this research area of weight status and self-esteem/body satisfaction.

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Appendices

Appendix A

Information Sheet

My name is Lauren Sherlock, I am currently a 3rd year undergraduate student at National College of Ireland carrying out research for my final year project.

Objectives

The aim of this study is to investigate the role of weight loss in self-esteem and body satisfaction. This study will be conducted using participants from two groups, (a) those who are attempting to lose weight (b) those who have no desire to.

Participation

Please note that the participation of this study is voluntary and you will only have to proceed if you wish to participate. If you decide to proceed you will be asked some personal information like age, gender, and which category you fall into. In the questionnaires, you will be asked how strongly you agree or disagree with statements presented to you. Participation in this study should take no longer than 10 - 15 minutes. You must be over 18 to participate in this study.

Risks

There is a potential risk of specific questions causing distress based on the nature of the study, if this occurs please contact one of the organizations linked in the debriefing form or feel free to cease participation in the study.

Confidentiality

Anonymity is important, the responses of these questionnaires will be anonymous. Each participant will be given a unique code that will be inputted into a database on a password protected computer. Your information will not be tracked back to you however this also means that once the responses are submitted you unfortunately cannot withdraw from the study at any point.

Debriefing

Thank you for your participation in the study entitled.

'An investigation into the impact of weight loss on self-esteem and body satisfaction'

If you have any questions or queries regarding this study, please contact the researcher or supervisor now.

Researcher: Lauren Sherlock

Email: X15307026@student.ncirl.ie

Supervisor: Michael Cleary Gaffney

Email: michael.cleary-gaffney@ncirl.ie

If your participation in this study causes any psychological distress, I advise you to seek support. Below are suggested organizations that you can contact:

Your local GP

Samaritans Dublin: (01) 116 123

Irish Association for Counsellors and Psychotherapists: (01) 230 3536.

Once again, I extend my gratitude for your participation. I appreciate your cooperation and time.

Sincerely,

Lauren Sherlock.

Appendix B

Consent Form

Please read the below statements and tick the provided box to confirm that you have read, understood and agree with them.

1. I have read and understand the information sheet provided for this study. I took the opportunity to consider said information and had the chance to enquire about any questions or queries.
2. I understand that my participation is voluntary and once submitted I cannot withdraw.
3. I understand that my responses are confidential and no information will be identifiable.
4. I agree to participate in this study.

- o Yes
- o No

Appendix C

Demographics

1. Gender
    - Male
    - Female
    - Prefer not to say
2. Age

    _____
3. Category
    - In weight loss group (e.g. slimming world, slim for life, weight watchers etc.)
    - Attempting to lose weight without support from a weight loss group
    - No desire to lose weight
4. If attempting to lose weight, please specify the amount of weight lost (If no attempt place N/A).

    _____
5. If attempting to lose weight, please specify the amount of weight intended to lose (If no attempt place N/A).

    _____

Appendix D

Body Self-Esteem Scale

On this page are listed a number of body parts and functions. Please read each item and indicate how you feel about this part or function of your own body using the following scale:

1 = Have strong negative feelings

2 = Have moderate negative feelings

3 = Have no feelings one way or the other

4 = Have moderate positive feelings

5 = Have strong positive feelings

Body Scent _____1 2 3 4 5

Appetite _____1 2 3 4 5

Nose _____1 2 3 4 5

Physical Stamina _____1 2 3 4 5

Reflexes _____1 2 3 4 5

Lips _____1 2 3 4 5

Muscular Strength _____1 2 3 4 5

Waist _____1 2 3 4 5

Energy Level _____1 2 3 4 5

Thighs _____1 2 3 4 5

Ears _____1 2 3 4 5

Chin _____1 2 3 4 5

Body Build _____1 2 3 4 5

Physical Condition _____1 2 3 4 5

Buttocks _____1 2 3 4 5

Agility _____1 2 3 4 5

Width of Shoulders _____1 2 3 4 5

Arms _____1 2 3 4 5

Chest/Breasts _____1 2 3 4 5

Appearance of Eyes _____1 2 3 4 5

Hips _____1 2 3 4 5

Cheekbones/Cheeks _____1 2 3 4 5

Legs _____1 2 3 4 5

Figure/Physique _____1 2 3 4 5

Sex Drive _____1 2 3 4 5

Feet _____1 2 3 4 5

Sex Organs _____1 2 3 4 5

Appearance of Stomach_____1 2 3 4 5

Health _____1 2 3 4 5

Body Hair _____1 2 3 4 5

Face _____1 2 3 4 5

Weight _____1 2 3 4 5

Appendix E

Rosenberg Self-Esteem Scale

Please rate the following statement according
1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

I feel that I am a person of worth, at least on an equal plane with others. *

Strongly Agree
1
2
3
4
5
Strongly Disagree

I feel that I have a number of good qualities. *

Strongly Agree
1
2
3
4
Strongly Disagree

All in all, I am inclined to feel that I am a failure. *

Strongly Agree
1
2
3
4
Strongly Disagree

I am able to do things as well as most other people. *

Strongly Agree
1
2
3
4
Strongly Disagree

I feel I do not have much to be proud of. *

Strongly Agree

1
2
3
4

Strongly Disagree

I take a positive attitude to myself. *

Strongly Agree

1
2
3
4

Strongly Disagree

On the whole, I am satisfied with myself. *

Strongly Agree

1
2
3
4

Strongly Disagree

I wish I could have more respect for myself. *

Strongly Agree

1
2
3
4

Strongly Disagree

I certainly feel useless at times. *

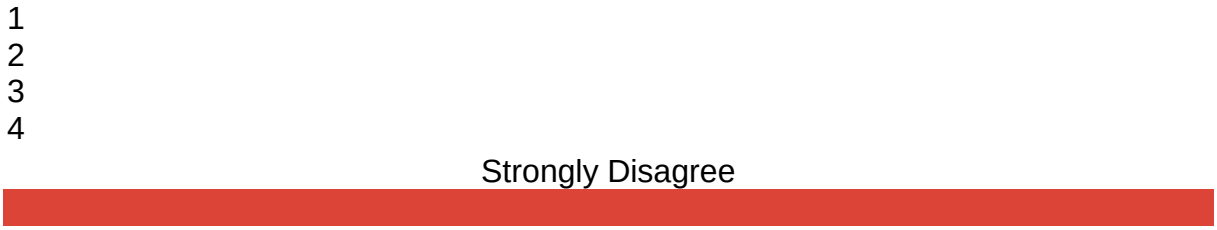
Strongly Agree

1
2
3
4

Strongly Disagree

At times, I think I am no good at all. *

Strongly Agree



Word Count (excluding graphs/tables)

Introduction – 2,889

Methods – 1,220

Results – 1,636

Discussion – 2,055

Total = 7,800