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**[HEALTHY- WEIGHT
CHILDREN WHO WANT
TO LOSE WEIGHT:
PREVALENCE AND
RELATIONSHIP WITH
EATING BEHAVIOUR.]**

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During writing this dissertation, I thought that I should thank many people for helping me completing this work. So firstly, I would like to thank the British council for giving me the opportunity to peruse my education, and do a master's degree in the UK. I would also like to thank my supervisor, Dr Judy Swift for helping me throughout all the steps of this study.

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Abstract

Objectives: The western culture, and, increasingly, many other parts of the world, depicts the “thin body” as a standard ideal of beauty. This has increased weight-loss desires, especially among adolescents and school-children, and set a new imagined target that these two vulnerable groups strive to achieve. This study divided weight-related concerns into three groups, according to their appropriateness with each child’s BMI. The three groups are those with excessive concerns, appropriate concerns and insufficient concerns. The main focus was the children in the excessive weight-related concerns group. The study looked at how they translated these concern into dieting practices and behaviours.

Design: Cross-sectional survey

Participants: 9,755 school children (year 8 (age 12-13) and year 10 (age 14-15)) from across the United Kingdom and Wales. Of those, 1,133 were healthy-weight children.

Methodology: SHEU (School and Student’s Health Education Unit) collected the data -used in this study- in 2010, using a health-related behaviour questionnaire that was given out in the UK and Wales schools. This questionnaire depended on a self-reported height and weight. These two variables were used to calculate Body Mass Indexes (Kg/m^2) of children, which were used to categorize the healthy-weight children into the three weight related concerns groups mentioned earlier. Moreover, some questions were used to analyse the effect of weight-related desires on eating behaviours.

Results: This study found that gender and age had an influence on weight-loss desires and dietary practices among children. It also found that weight loss desires play a role in determining some dietary behaviours, such as dairy avoidance or physical activity levels- among school children, especially healthy weight ones.

Conclusion: This study aims to draw attention towards the excessive- weight related concerns of healthy- weight children, which sometimes become translated into harmful dietary behaviours, in their pursuit to attain what it is advertised as the ideal body. This study deems it essential to highlight the global shift towards desiring underweight bodies, and its implications.

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Chapter 1: LITERATURE REVIEW

1.1 Body image and weight perception

Along with the massive increase of obesity and overweight rates worldwide (WHO, 2013), eating disorders and underweight conditions prevalence is also increasing (Smink et al., 2012). This contradiction might be due to a variety of reasons, which may include distorted body image, cultural influence and social pressure. The concept of body image is very complex, and it is hard to be summarized in one simple definition, however one researcher found that the closest and most comprehensive definition of it could be "... The picture we have in our minds of the size, shape and form of our bodies; and of our feelings concerning these characteristics and our constituent body parts" (P130, Soros et al., 2011). Although this definition is general and not exclusive to children or adolescents, but it might be applied to them as well.

1.1.1 Factors affecting child's body image

A person's body image is reflected on his/her body satisfaction, which is influenced by many factors; age, gender, culture, etc. For instance, younger adolescents tend to perceive themselves as larger than their current body weight is, more so than older ones, which eventually decreases their body satisfaction (Dunkel et al., 2010). Generally, females are more concerned with their body image than males, and more specifically, underweight and normal weight girls are more interested in losing weight than overweight ones (Liechty & Lee, 2013). Moreover, females are more likely to have higher percentages of body dissatisfaction than males (Aguilar et al., 2010).

As mentioned before, body weight had a strong effect on a child's body satisfaction. One study revealed that 47.4 % of participating adolescents were overweight or at risk of being overweight. Among this sample only 22.3 % perceived themselves as overweight, and over 20 % of them perceived themselves as underweight (Brenner et al., 2004). In contrast, other studies suggested that adolescents with higher body mass indexes have greater body dissatisfactions and losing weight desires than others (Caltabiano & Ricciardelli, 2013).

Many factors could impact the association between body weight and body image, and they might include weight-related teasing during childhood, history of weight cycling, having eating disorders...etc. (Caltabiano & Ricciardelli, 2013).

Other factors like cultural beliefs might also play an important role in body image and satisfaction. This is clearly demonstrated; as some cultures perceive overweight males as "big and strong" instead of "fat". Other cultures pay more attention to family, community and religion, which might decrease the attention towards the appearance and body image (Caltabiano & Ricciardelli, 2013). Some studies argued that religious practices have a positive effect on mental health and self-efficacy. For example, highly religious groups of Catholic and Protestant adolescent women recorded less weight loss practices than others of non-religious women (Dunkel et al., 2010). Furthermore, ethnicity is a factor, as one study suggested that eastern ethnic groups reported higher body satisfactions than western ethnic groups (Dunkel et al., 2010).

1.1.2 Weight perception

There is a possible connection between body image, body satisfaction and body weight perception. By the means of how adolescents perceive themselves and their body weight, how it affects their body satisfaction, and more importantly how do they react to it. In 2013, one study revealed that a very high percentage -41.22 %- of adolescents had problems with body weight perception. Of those, 34 % of females and 22.4 % of males with normal body weight perceived themselves as overweight (Jauregui-Lobera et al.). Therefore, it could be concluded that the self-reception of an overestimated body weight is frequent among adolescents (Jauregui-Lobera et al., 2013).

1.1.3 Factors affecting children's weight perception

Previous research proved that gender differences may play an important role in weight perception. On one hand, normal weight adolescent females tend to perceive themselves inappropriately as overweight, and they try to be thinner by means of dieting. On the other hand, adolescent males want to be heavier through muscle building (Wardle & Johnson, 2002).

Another possible factor influencing body weight perception is how people define the healthy body weight. Thomas and Irwin conducted a research in 2009 to reveal how adolescents define the healthy body weight and what affects it. Most participants expressed it as a combination of healthy eating with a regular physical activity. Some included psychological dimensions and others mentioned ideal physiques. Therefore, correct definition of a

healthy body weight might be associated with better healthy weight perceptiveness.

1.2 The cultural ideal

The ideal body weight is decreasing in recent years all over the world, and an alternative "ideal" body thinness is spreading. The western cultures are associating the female beauty with their thin figures and lean bodies. And creating a V-shaped, muscular bodies for men (Caltabiano & Ricciardelli, 2013). This conceptualization of beauty is also slowly spreading in other parts of the world (Dunkel et al., 2010).

1.2.1 Role of media

It is perhaps safe to say that media is the main platform to send messages about femininity and women beauty. It has a reasonable influence on costumers by advertising, and verbal messages concerned with dieting and eating (Caqueo-Urizar et al., 2011). This might affect women's body satisfactions and eventually their dieting behaviours. Media messages could also be associated with pressure to attain thin body shape as in published photos and videos (Dunkel et al., 2010). Additionally, some researches represent body image dissatisfaction in terms of thinness desire (Davison & McCabe, 2006).

Some countries are aware of the consequences of advertising thinness as an ideal; therefore they are making efforts to counter that message both in the fashion world and in the media. There are multiple examples on these interventions in different countries. For instance, India and Israel have banned models with low body mass index from fashion shows. Along the same line, governments of Germany, Italy and Spain reached an agreement with the fashion

business companies to change some details in their work, including production, labelling and advertising. Putting those agreements into effect might increase the production of large size cloths, and will also stop underweight models from working on the catwalks (Dragone & Savorelli, 2012). But regardless of these efforts, media is still working effectively in disseminating these messages.

On a positive note, previous literature suggests that religious beliefs and practices may have a positive effect, by decreasing the attractiveness of the media-propagated thinness ideal. One study revealed that young Muslim females wearing the veil are less likely to be influenced by these messages than other Muslims with a less religion lifestyle (Dunkel et al., 2010).

1.2.2 Media and adolescents

It could be said that all people in different age groups are affected by these messages. But it could also be argued that adolescents are the most affected group; a study revealed that adolescent women experienced great body dissatisfactions after viewing ten thin-ideal stereotype images, more so than older women (Dunkel et al., 2010). This is mainly because adolescence is a period of transition from being a child to an adult (Caltabiano & Ricciardelli, 2013), which might involve education, training and living circumstances (Richard, 2010). Adolescence is also the phase of the main developmental changes in a child's body, such as puberty, physical maturation, identity development, and peer relationships (Dunkel et al., 2010). Moreover, puberty is one of the most important adjustments adolescents need to make. It might be harder for females, as they might experience an increase in body fat, faster weight gain and menstruation. All these changes could cause their bodies to look less like western cultural ideals (Richard,

2010). Moreover, adolescent female populations might be the most susceptible to sociocultural pressure (Esnaola et al., 2010). In the same line of literature, scientists have suggested that body size increase during male puberty may result in a physique that will match the muscular male cultural ideal, so the change grants a more positive experience for boys than for girls (Davison & McCabe, 2006).

It is worth mentioning, that Erikson's theory stated that all people pass through a genetically determined sequence of physiological stages throughout their lives. These stages involve a conflict between two personality outcomes - positive and negative - (Richard, 2010). Adolescence is one of these main stages, and this conflict might affect adolescent's confidence and body satisfactions.

1.3 Consequences of body weight dissatisfactions and weight loss desires

As mentioned before, media plays a major role in sending messages, influencing adolescents' body dissatisfaction, and increasing their body image distortions. These consequences might have positive or negative effects.

1.3.1 Potential positive effect of body dissatisfactions

It was suggested that some overweight and obese adolescents have misperceptions regarding their body weight. They might not perceive themselves as "extra weight" individuals, which might decrease their engagement in weight management practices (Brenner et al., 2004). Less engagement may be correlated with different short and long-run health risks (O'Dea, 2006). Adolescent

obesity is associated with Type 2 diabetes mellitus, which Ludwig suggested that the incidence of type 2 Diabetes has increased in the past 2 decades, by a factor of 10 (2007). Heart complications could also be a consequence of adolescent obesity, escalated blood pressure, respiratory rates conditions and cardiovascular diseases (O'Dea, 2006). Obesity could also increase the incidence of eating disorders in adolescents, along with other problems like anxiety, depression and being socially isolated (Ludwig, 2007). Dangerously, Ludwig also found that middle age mortality risk is increased two to three times among obese adolescent females, more than healthy-weight ones (2007).

Taking all mentioned and unmentioned health complications of obesity into consideration, it might be appropriate for overweight and obese individuals to be engaged in a weight loss programs. For overweight and obese people, high levels of body dissatisfaction might be positive, as they lead to higher social pressure, which might increase the individuals' motivation to change their lifestyles, or adapting healthier eating behaviours (Stice, 2002).

It is of the health promotion industry interest to incite overweight body dissatisfaction. This can be done, for example, through an advertising campaign that introduces pictures of overweight individuals being unable to engage in everyday activities, such as parenting. The goal is to incite negative feelings towards these pictures and, in turn, towards the targeted individuals' overweight status.

1.3.2 Potential negative effects of body dissatisfaction

In contrast to all the positive effects of body dissatisfactions mentioned earlier, high levels of body dissatisfaction could increase adolescents' - mainly overweight and obese ones'- negative self-talk, which might thwart the motivation and eventually the change. Such individuals are more likely to use negative eating behaviours instead of positive ones (Caltabiano & Ricciardelli, 2013).

Body image definition can include the picture present in individuals' minds about their bodies. This definition makes a person's body image closely related to his/her self-esteem (Husebscher, 2010). For this reason, any Body image dissatisfactions might have negative effects on psychological and physiological and behavioural aspects.

1.3.2.1 Psychological aspects

A study by Davison and McCabe describes how adolescents' - mainly females'- self-esteem is strongly associated with, or in some cases derived by, other people's evaluation of their looks, and to what extent they appear like others (2006). They also focus on the importance of considering self-esteem when considering body image effects on social context. This is also correlated with the study that found that adolescent females with higher body satisfaction, appearance, and eventually higher self-esteem are having more positive social life than others with lower satisfactions (Husebscher, 2010).

1.3.2.2 Physiological aspects

Studies have shown that adolescents who have a disturbed body image are more likely, on the long run, to develop mental disorders

than others who have positive body image (Caltabiano & Ricciardelli, 2013). For both genders, body dissatisfaction was found to have a correlation with depression, anxiety and stress (Nichols et al., 2009).

1.3.2.3 Behavioural aspects

Previous researchers found that there is an increase in the prevalence of disturbed body images among adolescents, which may include body weight satisfactions, shape and muscle concerns (Caltabiano & Ricciardelli, 2013). These disturbances could be associated with higher engagement in weight management programs, nutritional behaviours and changes in lifestyle (Brenner et al., 2004). These body change related attitudes may include disordered eating behaviours, obligatory exercise, steroid usage, supplements for diuretic purpose and weight loss pills (Caltabiano & Ricciardelli, 2013). In one Australian study, 54 % of female adolescents reported dieting, another 7 % reported self-induced vomiting, and 28 % percent reported skipping meals (Guest et al., 2010). Moreover, one study suggested that self-efficacy might be adversely related to eating behaviours and total food intake at meals (Glasofer et al, 2013).

Unhealthy weight loss behaviours may include different practices; such as unhealthy eating, or unhealthy dieting (Littleton & Ollendick, 2003). These two habits may vary from caloric intake restrictions, skipping meals, avoiding certain food items, or to an extent, purging, smoking, or exercising excessively (Dragone & Savorelli, 2012). Specifically, underweight and normal weight adolescents with least body satisfactions might perceive themselves as being overweight, which might increase their dieting

attempts. This increases their risk of developing eating disorders as bulimia or anorexia nervosa (Brener, et al., 2004).

1.3.2.3.1 Possible consequences of unhealthy dieting behaviours

It is well established that these unhealthy eating behaviours are not effective in losing weight, and their long term consequences are very harmful on the dieter's health. Hill has revealed that females, who tried dieting during adolescence, are more likely to become obese and gain weight than other non-dieting females of the same age (2007). Research has suggested that uncontrolled weight loss attempts during adolescence may lead to disturbed growth, height stunting, delayed puberty and more defects in bone length and density (O'Dea, 2005).

Different weight loss diets were analysed to detect their benefits and possible harms. For example, high- saturated fat diets were likely to increase serum cholesterol and cause coronary heart disease on the long-run. In the same study, high- sugar diets were also found to have a possible link to coronary heart diseases (Anderson et al., 2000). Another study suggested that cutting dairy products from the diet, especially in a critical growth period such as adolescence, may increase the incidence of osteoporosis and leads to a higher blood pressure (Rangan et al., 2012).

1.4 Gaps in the Literature review

The main focus of the reviewed literature was the eating behaviours of adolescents. Most studies focused on overweight and obese adolescents. For example, a study by Newman stated that the current literature in the UK had clearly explained the difference

of weight- related concerns among adolescents in the four weight classifications (underweight, healthy-weight, overweight and obese) (2008). This study limits the research to healthy-weight adolescents with different weight related concerns. More specifically, it studies the appropriateness of these concerns according to the children body mass indexes. Additionally, this piece of work reveals different dieting behaviours among healthy-weight children/adolescents.

The nature of the sample used in this study is unique; due to being newly collected- 2010-. More importantly, the participants are from the UK and Wales. These two factors limit the scope of the research and make it easier to find and implement solutions. In contrast to previous studies which took one dieting behaviour at a time, this study analyses a range of dieting behaviours among the same group of healthy weight children, and how they are related to weight loss concerns and appropriateness.

Finally, the results of this study are more likely to have a positive impact on the English adolescent society, by increasing awareness towards this specific, and often vulnerable, group of children and preventing harmful consequences that might damage their health in the near and far futures.

1.5 Aims

The purpose of this study is to detect the prevalence of weight loss desires among healthy- weight children across the United Kingdom and Wales, and to investigate their eating behaviours.

1.6 Research objectives

The objectives of this study are:

- (1)** To describe the prevalence of appropriate and inappropriate weight-related concerns in a representative sample of healthy-weight young people from across the UK and Wales.
- (2)** To investigate the multivariate relationships between appropriate and inappropriate weight-related concerns and gender and age.
- (3)** To test whether there is any significant difference in diet quality (i.e. 'healthy eating' and 'unhealthy eating' scores), skipping breakfast, or dairy avoidance among healthy-weight children with excessive weight-related concerns, compared to those with insufficient or appropriate weight-related concerns.
- (4)** To test whether there is any significant difference in physical activity levels among healthy weight children with excessive weight-related concerns, compared to those with insufficient or appropriate weight-related concerns.

1.7 Research hypothesis

The hypotheses of this study are:

- (1)** Out of all weight-related concerns among children in the UK and Wales, Appropriate concerns might have the highest percentage of prevalence, followed by Excessive and Insufficient weight-related concerns, respectively.
- (2)** Older group (year 10) of children could have significantly higher percentages of excessive-related concerns than younger ones (year 8).
- (3)** Females might be more likely to have significantly higher percentages of excessive-related concerns than males.
- (4)** The excessive weight-related concerns group might have the highest percentages of unhealthy food scores, dairy avoidance, skipping breakfast in comparison to other weight-related concerns groups.
- (5)** Different weight related-concerns groups might show a significant difference in physical activity levels percentages.

Chapter 2: METHODS

2.1 Data Collection

This research involved the analysis of secondary data from School and Student's Health Education Unit (SHEU); a research unit founded in 1977, and which surveyed school students in the United Kingdom and overseas. The unit collects the data using the Health-Related Behaviour Questionnaire, which covers several aspects of life: personal information, nutrition, smoking, drinking, drugs, health and safety, mental health, leisure time and Exercise. This unit published several surveys and reports on the health and wellbeing of children and adolescents.

The participants of this survey were young school children, enrolled in year 8 (age 12-13) and year 10 (age 14-15), from 315 different schools across the UK and Wales in 2010. The children completed the survey using two different versions of the mentioned questionnaire (HRBQ), with the help of their school's staff.

2.2 Measures

To answer the research questions, specific data from the questionnaire were extracted (e.g. questions of smoking and drugs were excluded). These were:

Demographics:

- A. Age: some participants were asked about their age in years and months, and others were only asked to answer in years. The participants who answered the version with only years – not months- were included.

B. Gender: "Are you male or female" was the question used to record participant's gender.

Anthropometric measurements:

A record of each participant's weight and height was taken. Participants have the choice to answer in either metric or imperial units. Answers in imperial were converted to metric to be used in the study.

Body Mass Index (BMI) was calculated by dividing participant's weight in kilograms on the square of their height in meters. BMI was expressed as kilograms per meter squared (Kg/m²).

Participant's BMI Interpretation was done by using Cole et al. cut-offs, which defines children overweight and obesity on one hand and children thinness on another (Cole et al., 2000, 2007). These cut-offs combine the child's age and gender with their BMI to get children-specific classification.

As a result, participants were classified in different weight groups according to their Body Mass Index. And these groups are:

1. Underweight
2. Healthy-Weight
3. Overweight
4. Obese

All participants who did not answer on either weight or height or both were excluded from the study using the list wise deletion.

Weight- related concerns

Participants were asked “Which statement describes you best?” and they had to choose one of these options 1. “I would like to put on weight”, 2. “I would like to lose weight” 3. “I’m happy with my weight as it is”.

Cases with missing answers on the previous question were excluded. Case wise deletion method was used to exclude these cases only in related questions.

Skipping breakfast

Participants were asked “Did you eat or drink anything before lessons this morning?” with different answers options:

- No, Nothing at all
- Yes, Something at home
- Yes, Something at school
- Yes, Something on the way to school

If the answer of the previous question was yes, they were additionally asked “What did you have to eat or drink before lessons this morning?” and select all they consumed that morning:

- A Drink
- Cereal
- Porridge/ready brek
- Toast or bread
- Fruit
- Yoghurt
- Crisp-type snack
- Chocolate bar, sweets
- Breakfast bar
- Pop tarts, cakes, muffins
- Cooked breakfast
- Something else

Their answers on the specific items consumed were used to detect any inconsistencies between the two breakfast answers. For instance if one child answered with nothing for breakfast and then chose one or more items of breakfast this will be considered inconsistent. Any child with that case was excluded from the analysis of the question (again case wise deletion).

After filtering out missing answers or inconsistencies, participants were divided into two groups: "skipping breakfast" or "having breakfast" according to their answer of these question.

Healthy and unhealthy Food

Participants were asked "How often do you eat or drink the following?", and to give a score from 0 to 3 (where 0 = 'Rarely or never', 1 = 'Once a week or less', 2 = '2-3 days a week', 3 = 'On most days') for each of these items:

- Wholemeal bread
- High-fibre cereals or muesli
- Salads
- Vegetables
- Crisps
- Chips or roast potatoes
- Fresh fruit
- Sugar-coated cereals
- Fizzy drinks (not low-calorie)
- Sweets, chocolate, choc bars

Dietary Analysis was conducted on the answers of previous question to calculate Healthy Food Score (HFS) and Unhealthy Food Score (UHFS) of participants, using the exact method which was used in previous research projects (Jacqueline Lesley Newman Research) which used Cartwright et al. (2003) criteria.

A. HFS was calculated for specific items: (1) wholemeal bread (2) High- fibre cereals or muesli (3) Fresh fruits (4) Salads (5) Vegetables. The score was from 0 to 15, where 15 (maximum 5 for each item), being the highest score for healthy items consumption. And 0 is the lowest score of healthy items consumption- indicating less healthy food intake-.

B. UHFS was calculated using the same method for calculating HFS, but with different food items: (1) Chips or roast potatoes (2) Sugar coated Cereals (3) Fizzy drinks (not low- calorie) (4) Crisps (5) Sweets, chocolate and choc bars. Similarly, the score was from 0 to 15, where 15 demonstrates highest consumption of unhealthy food items and 0 demonstrates least consumption of unhealthy food items.

Again, participants with one or more missing answers of previously mentioned food items consumption were excluded from the analysis of this question- using case wise deletion-. The food score of that child could not be calculated.

Dairy products consumption

Participants were asked "How often do you eat or drink the following?" And to give a score from 0 to 3 (where 0 = 'Rarely or never', 1 = 'Once a week or less', 2 = '2-3 days a week', 3 = 'On most days') of any dairy products (e.g. cheese, milk).

After analysing the answers of the previous question, participants were divided into two groups. The first group is 'Dairy Avoidance' for any '0' answers ('Rarely or never' consumption), the second is 'Dairy Consumption' for any other answer.

As in other eating behaviours, cases with missing answers were excluded using case wise deletion.

Physical activity

Participants were asked "How many days last week did you exercise enough that you had to breathe harder and faster" and to give a score from 0 to 7 (where 0 = none, 1= once, 2= twice, etc...)

Depending on the UK governmental report of 'Start active, stay active' (Department of Health, 2011), participants were divided into two groups according to their answers of the previous question. The first group is 'Sufficient Exercise' for participants who did three or more days of exercise, and the second is 'Insufficient exercise' for participants who did less than 3 days of exercise per week.

Participants with missing answers were excluded from the analysis using case wise deletion.

2.3 Focus Group

Because this study focuses on healthy- weight children, a further step had to be implemented after collecting the participant's answers on all the previous questions. This group of children was divided into three groups according to their answers on their weight loss desire question mentioned earlier.

These groups are:

Excessive weight-related concerns: For all healthy-weight children who answered with "I would like to lose weight".

Appropriate weight-related concerns: For all healthy-weight children who answered "I'm happy with my weight as it is".

Insufficient weight-related concerns: For all healthy-weight children who answered "I would like to put on weight".

The analysis of each variable mentioned previously, was conducted twice. The first one was conducted including all the participants who completed the questionnaire, and the second only including healthy-weight children, to detect how their weight loss concerns affect their dieting behaviour.

2.3 Data Analysis

IBM SPSS statistics data editor was used to analyse the data which were collected from the questionnaire. Different variables were created to identify the relationship between weight-related desires of healthy-weight children and other variables of eating behaviours. Chi-square test (χ^2) was used for all categorical data, considering significance as P value of <0.05. If appropriate, (2*2) chi-square, post hoc tests were performed to identify further relationships. Moreover, the Mann-Whitney test was used to test continuous data, like healthy eating food scores.

2.4 Missing Data

As mentioned earlier, Case-wise deletion was used to filter out any missing answers on specific questions. This policy might be the most convenient for this study, in which the number of lost participants is not high. Moreover the alternative way which depends on the prediction of sample's data was not used to avoid any misleading results.

2.5 Ethics

As this project involved secondary analysis of previously collected anonymous data, ethical approval was not required. However, a data sharing agreement was completed for confidentiality, data security and publishing purposes. A photocopied paper of the agreement is available in appendix 1.

Chapter 3: RESULTS

3. 1 Research participants

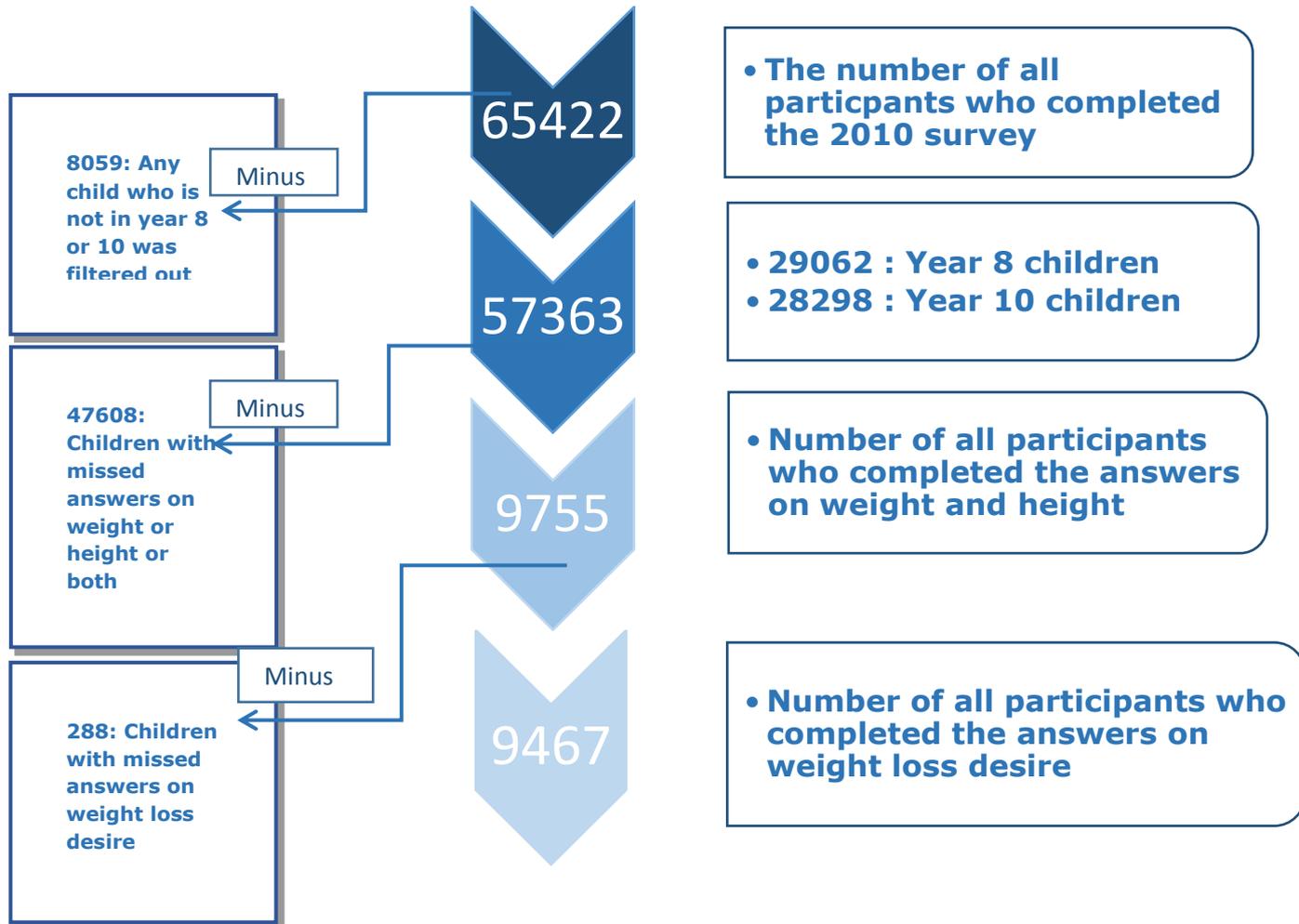


Figure 3.1: Flow chart shows the steps carried out to filter out cases

SHEU collected these data from 65422 participants across the United Kingdom and Wales in 2010. Certain filtration steps were conducted in steps to comply with this research project (Figure 3.1).

3.2 Demographics and anthropometric measurements

After the first step of filtration, all children who are not in year 8 or 10 were excluded -8059 participants-. Afterwards, this study was conducted on 57,363 children from all over the UK and Wales, 29065 of them were in year 8 (age 12-13), and 28298 were in year 10 (age 14-15). Almost half of the sample was females (51.1 %). Additionally, 47608 participants were filtered out of any further analysis, because of missing answers on weight or height. According to the self-reported height (cm²) and weight (kg), children were classified in four weight categories. Healthy- weight children got the highest percentage of weight categories (64.3 %), 13.0 % of the children were categorized as underweight. Another 12.0 % were overweight, and only 10.7 % were obese.

Participant' distribution according to their Age and Gender in comparison to weight classification is explained in table 3.1 and 3.2, all in numbers and percentages.

Table 3.1 Participants of year 8 anthropometric measures

	Year 8			
	Males		Females	
Underweight 1	45	11.2 %	58	18.8 %
Healthy-weight	254	63.3 %	184	59.5 %
Overweight 2	51	12.7 %	27	8.7 %
Obese 2	51	12.7 %	40	12.9 %
Total	401		309	

Table 3.2 Participants of year 10 anthropometric measures

	Year 10			
	Males		Females	
Underweight 1	63	10.4 %	64	14.1 %
Healthy-weight	404	66.6 %	298	65.5 %
Overweight 2	96	15.8 %	39	8.6 %
Obese 2	44	7.2 %	54	11.9 %
Total	607		455	

1: This group was classified using Cole et al, 2007 international cut-off points for thinness 18.5 kg/m².

2: These groups were classified using the definition of child overweight and obesity worldwide (Cole et al, 2000)

3.2.1 Missing answers on Height and weight

The all children who missed answers on either their height or weight were significantly most likely to be females and younger children in year 8 (P-value =<.001) (Table 3.3). Likewise, males were more likely to answer their weight and height compared to females ($X^2 = 49.24$, $df = 1$; P-value <0.001).

Table 3.3 Distribution of missing answers on Height or weight

	Males	%	Females	%		Year 8	%	Year 10	%
Missing Ht./ Wt.	22958	81.9	24644	84.1		24840	85.5	22768	80.5
No missing Ht./Wt.	5083	18.1	4668	15.9		4225	14.5	5530	19.5
Total	28041	100	29312	100		29065	100	28298	100

3.3 Weight related Desires

Almost half of the participants were happy with their weight, and wanted their weight to stay as it is (n= 4556, 48.2 %). Another 40.8 % of them wanted to lose weight (n= 3859). And only 11.1 % (n= 1049) of the participants wanted to put on weight. The desire to put more weight was most common among underweight children and decreased as weight increases (Table 3.4). The percentages of weight loss desire among different weight classification are varied but mostly among overweight and obese participants. The percentage of children with body weight satisfaction and who answered "happy with weight as it is" was greatest among underweight and healthy weight children.

Table 3.4 Weight loss desires in comparison to participant's weight classification

	Under-weight	%	Healthy-weight	%	Over-weight	%	Obese	%
Would like to put on weight	52	22.8	121	10.7	4	1.9	11	5.9
Would like to lose weight	58	25.4	440	38.8	140	65.7	125	67.2
Happy with weight as it is	118	51.8	572	50.5	69	32.4	50	26.9
Total	228	100	1133	100	213	100	186	100

3.3.1 Missing answers on weight loss desires

Males were significantly more likely to abstain from stating their weight loss desire than females ($X^2 = 18.282$, $df = 1$; P -value < 0.001). Meanwhile, younger children in year 8 tend -not significantly- to miss answering this question more often than older children (Table 3.5).

Table 3.5 Distribution of missing answers on weight loss desires

	Males	%	Females	%	Year 8	%	Year 10	%
Missing WLD answer	187	3.7	103	2.2	142	3.4	152	2.7
No missing WLD answer	4896	96.3	4565	97.8	4083	96.6	5378	97.3
Total	5083	100	4668	100	4225	100	5530	100

This study focuses on children with a healthy weight. These were divided into three categories, according to their weight loss desires. In the next page, figure 3.2 illustrates their distribution.

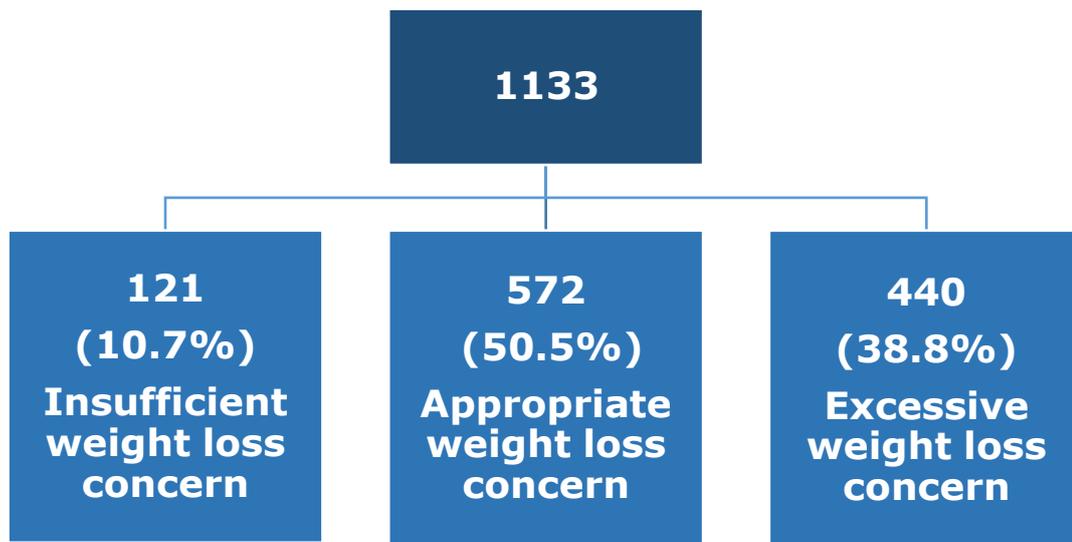


Figure 3.2: Flowchart shows the valid participants (who were divided according to their weight-related concerns)

On one hand, Females had significantly higher percentages in the group of excessive weight loss concerns compared to males (61.4 % vs. 38.6 %) (P-value = <0.001). On the other hand, males have higher percentages in insufficient weight loss concerns group (84.3 % vs. 15.7 %) than females, and to a lesser extent in appropriate weight loss concerns (66.6 % vs. 33.4 %).

Regarding the differences in years grouping and weight related desires, older children in year 10 were significantly more likely to have appropriate concerns (48.6 %) than insufficient concerns (6.2 %) (P-value <.001), and they were also - not significantly- more likely to have appropriate concerns than excessive ones (37.6 %). Younger children in year 8, had the same trend of results distribution, but with higher percentage in insufficient weight loss concerns (13.5 %).

3.4 Food Scores

3.4.1 Healthy Food Score

The healthy food score could range between zero and fifteen. the score of zero represents the least healthy food consumption, and the score of fifteen is the healthiest consumption. Five food items were used for each group-healthy and unhealthy-, 5 is the maximum score for each group. In this study, 15 was the maximum score gotten and 0 was the minimum, with the average score of 8.69. A significantly higher consumption of healthy food was among females compared to males (P-value <.001). Moreover, younger children consumed slightly higher amounts of healthy food compared to year 10 children (Table 3.6).

Table 3.6 Healthy food scores of participants

	Males	Females	Year 8	Year 10
Mean score	8.35	9.06	8.77	8.62
Standard Deviation	3.29	3.15	3.21	3.26
Significance (P-value)	<.001			

3.4.2 Unhealthy Food Score

In a similar manner, the unhealthy food score could also have a range from zero to fifteen, but zero score represents the least unhealthy food items consumption, and fifteen represents the highest consumption of unhealthy food items. The average of unhealthy food score was 7.28, with a maximum score of 15 and a

minimum of zero. Males had significantly higher consumption of unhealthy food than females (P-value <.001) (Table 3.7), while older children had a significantly higher consumption of unhealthy food.

Table 3.7 Unhealthy food scores of participants

	Males	Females	Year 8	Year 10
Mean score	7.94	6.55	7.13	7.39
Standard Deviation	3.17	3.07	3.07	3.29
Significance (P-value)	<.001		<.001	

3.4.3 Food scores and weight loss concerns appropriateness

Healthy-weight children had different unhealthy food scores (Table 3.8), where children with insufficient concerns have the highest unhealthy food scores in comparison to other groups of excessive or appropriate concerns. This indicates that insufficient weight loss concerns group consumed the highest amount of unhealthy food items. It is important to mention that children with excessive weight loss concerns have the lowest mean in unhealthy food consumption.

Table 3.8 Unhealthy food scores of healthy- weight children

	Number of participants	Mean	Standard Deviation
Excessive weight loss concerns	98	6.53	3.16
Appropriate weight loss concerns	133	8.08	3.27
Insufficient weight loss concerns	24	9.79	2.27

3.4.4 Missing answers on healthy and unhealthy food items consumption.

Some healthy-weight children showed more tendency than others to miss answers on healthy and unhealthy food items consumption (Table 3.9), especially among different weight loss desires. For example, all healthy children, in all weight loss desires, missed answering their consumption on one out five healthy food items. Moreover, missing answers on unhealthy food items consumption was prevalent among children with appropriate weight loss concerns. And healthy-weight children with excessive weight loss concerns had higher percentages of missing answers, compared to the one that were answered (77.7 % vs. 22.3 %).

Table 3.9 Distribution of missing answers on unhealthy food items among healthy-weight children

	Missing answers	%	No missing answers	%
Excessive weight loss concerns	342	39.0	98	38.4
Appropriate weight loss concerns	439	50.0	133	52.2
Insufficient weight loss concerns	97	11.0	24	9.4
Total	878	100	255	100

3.5 Skipping breakfast

Among all children who participated in the survey - before filtering out the ones with missing answers on weight or height-, only 16.7 % skipped breakfast. Gender differences were found in skipping

breakfast percentages, since females were more likely to skip breakfast than males (65.1 % vs. 34.9 %). Moreover, children in years 8 were significantly more likely to skip breakfast more than children in year 10 ($X^2 = 8.363$, $df = 1$; $P\text{-value} < .01$ (Table 3.10).

After filtration, 100 % of 9755 participants - who recorded their weight and height - had breakfast.

Table 3.10 Skipping breakfast percentages among all participants

	Males	%	Females	%		Year 8	%	Year 10	%
Had Breakfast	479	85.1	724	82.2		801	85.4	402	79.4
Skipped Breakfast	84	14.9	157	17.8		137	14.6	104	20.6
Total	563	100	881	100		938	100	506	100

3.5.1 Skipping breakfast and weight loss desires appropriateness

All healthy weight children had breakfast, 0 % skipped breakfast among all weight loss concerns.

3.6 Dairy Avoidance

The dairy consumption question was used to identify dairy avoidance habit among all children and healthy-weight ones in particular. Of all children who participated in the study, only a minor group missed dairy, 3.0 % ($n=212$ out of $n=7003$).

Regarding gender differences, males were more likely to miss dairy in their daily diet than females (Table 3.11). In a different comparison with age, younger children in year 8 were missing dairy in their diet at a higher percentage than older children (3.4 % vs.2.8 %).

Table 3.11 Dairy consumption percentages among all participants

	Males	%	Females	%		Year 8	%	Year 10	%
Consume Dairy	3537	96.7	3251	97.0		2941	96.6	3850	97.2
Missed Dairy	122	3.3	89	3.0		102	3.4	110	2.8
Total	3659	100	3340	100		3043	100	3960	100

3.6.1 Dairy avoidance with weight loss desire appropriateness

Differences in dairy avoidance behaviour were found between healthy- weight children with different weight loss desires. Children who missed dairy were all from appropriate (50 %) and excessive (50 %) weight loss concerns (Table 3.12). Meanwhile consumption of dairy was most likely to be among appropriate concerns children, with the least consumption among insufficient concerns group.

Table 3.12 Dairy avoidance among Healthy-weight Children

	Consumed Dairy	%	Missed Dairy	%
Excessive weight loss concerns	94	37.8	4	50.0
Appropriate weight loss concerns	131	52.6	4	50.0
Insufficient weight loss concerns	24	9.6	0	0.0
Total	249	100	8	100

3.6.2 Missing answers on Dairy Consumption among healthy- weight children

Table 3.13 shows the distribution of missing answers on dairy consumption question among healthy weight children with different weight related concerns.

Table 3.13 Distribution of missing answers on dairy consumption among healthy-weight children

	Missing answers	%	No missing answers	%
Excessive weight loss concerns	342	39.0	98	38.1
Appropriate weight loss concerns	437	49.9	135	52.5
Insufficient weight loss concerns	97	11.1	24	9.3
Total	876	100	257	99.9

3.7 Physical Activity sufficiency

Physical activity insufficiency occurred among a large scale of participants. Almost 30 % of the participants who answered physical activity level question were not doing physical activity sufficiently, which is three or more days a week. Significant differences were found between physical activity sufficiency and both age and gender (Table 3.14).

For instance, younger children were significantly more active than older children who have higher percentages in insufficient exercising (55.5 %) (P-value=<.001). Additionally, females were significantly more likely to do insufficient exercise than males ($X^2 = 277.142$, $df = 1$; P-value <0.001).

Table 3.14 Physical activity Sufficiency among all participants

	Males	%	Females	%		Year 8	%	Year 10	%
Insufficient Exercise	1250	29.7	1802	47.8		1192	34.6	1860	41.0
Sufficient Exercise	2964	70.3	1968	52.2		2251	65.4	2681	59.0
Total	4214	100	3770	100		3443	100	4541	100

3.7.1 Physical activity sufficiency with weight loss desire appropriateness

Among all healthy children who participated, 23.4 % did not do sufficient exercise (n = 267). Those were significantly more likely to be in the excessive weight loss concerns group than in appropriate weight loss concerns group ($X^2 = 11.63$, $df = 1$; P-value

<0.001) (Table 3.15). In those classified as children with insufficient weight loss concerns, insufficient exercise percentages (25.2 %) were low in comparison to their weight loss concerns.

Table 3.15 Physical activity Sufficiency among healthy children

	Insufficient Exercise	%	Sufficient Exercise	%
Excessive weight loss concerns	126	47.2	270	35.6
Appropriate weight loss concerns	113	42.3	405	53.5
Insufficient weight loss concerns	28	10.5	83	10.9
Total	267	100	758	100

3.7.2 Missing answers on physical activity levels

Among the three groups of weight loss desires of healthy- weight children, the distribution of missing answers was almost the same (Table 3.16). Excessive weight loss concerns group has the majority among non-missing answers category and a small number in the missed one (90.0 % vs. 10 %).

Table 3.16 Distribution of missing answers on physical activity among healthy-weight children

	Missing answers	%	No missing answers	%
Excessive weight loss concerns	44	40.7	396	38.6
Appropriate weight loss concerns	54	50.0	518	50.5
Insufficient weight loss concerns	10	9.3	111	10.8
Total	108	100	1025	100

Chapter 4: DISCUSSION

4.1 Weight Perception

In this study, body mass index was used to divide children into four groups: underweight, healthy-weight, overweight and obese participants, with the percentages of 10.4 %, 66.6 %, 15.8 % and 7.2 % respectively. Generally, in most studies- including this one-, healthy-weight children group occupies the vast majority of all participants (Newman, 2008).

Children in the four groups of weight classification have different weight related desires. This study focuses on healthy-weight children; therefore analysis was conducted on their weight related desires, and they were classified as excessive, appropriate and insufficient weight loss desires according to their BMIs. Although the majority of healthy-weight children had appropriate weight loss concerns (50.5%), but a high percentage of them were having an excessive weight loss concerns (38.8%). The percentage of healthy-weight children with excessive weight related concern is very close to a percentage conducted in a previous study: 37.8 % (Newman, 2008).

These concerns can be defined as:

1. Excessive weight loss concern: A weight related desire that includes children with appropriate weight (healthy BMI), but they want to lose weight for different reasons including body dissatisfactions.

2. Appropriate weight loss concern: A weight related desire that includes healthy-weight children who have body weight satisfaction and the desire of keeping their current weight.
3. Insufficient weight loss desire: A weight related concern that includes healthy-weight children who want to put on weight.

4.1.1 Age and gender differences

A 10-year-follow up study, showed that the levels of body dissatisfaction and weight related concerns are nowadays higher among both genders (Quick, V. et al, 2013). On the other hand, it has been reported that gender plays an important role in body perception, body dissatisfaction and weight loss desires (Liechty & Lee, 2013). This study demonstrates this effect of gender, by proving that females are significantly more likely to have excessive weight loss concerns than males. In comparison, males have more appropriate weight loss concern than females.

More differences between weight loss desires are found among age groups. This study found that older children are more likely to have excessive concerns than younger ones, which might be a main effect of body dissatisfaction. The exact opposite was shown in a different study, which indicates that body perception and satisfaction has a positive linear relationship with age (Tiggemann, M., McCount, A., 2013).

4.2 Dietary Practices

Dietary practices widely vary among children, and they may include binge-eating, skipping meals, cutting of certain food items or fasting. The desire of losing weight pulls children- mainly who have excessive weight loss concerns- to these unhealthy and restricted dietary practices. The tendency towards these dietary practices is increasing in adolescent's population worldwide (Moreno et al, 2010). In most cases these dietary practises are very harsh, because these children want to reach the desired weight in very short period of time. A study by Quick and Byrd-Bredbenner revealed that in a sample of adolescents, fourth of females and fifth of males reported dietary restrains, and one in each 7 participants was engaged in binge-eating (2013).

4.2.1 Healthy and unhealthy food consumption

Gender differences are also found among healthy and unhealthy food consumption. This study found that females have higher healthy food score than males, by this, males consume less healthy food items. Other studies had the same results regarding gender differences (Quiles-Marcos et al., 2011). More differences were found between years groups. This study and previous studies revealed that younger children consume higher amounts of healthy food items than older ones (Cuenca-Garcia et al., 2013).

In the same manner, males and older children have higher means in unhealthy food scores, and eventually consume more amounts of unhealthy food items than females and younger children.

More specifically, healthy-weight children with appropriate or inappropriate weight-loss concerns, have different means of unhealthy food scores. As expected, children in the excessive weight loss concerns group have the lowest mean of UHFS and the least consumption of unhealthy food items. In contrast, the group of insufficient weight loss concerns got the highest consumption of the same unhealthy food items. This is directly correlated with their weight related concerns, as more attention is given to the healthy food items and their nutritional components with the increased concerns about health and weight (Quiles-Marcos et al., 2011).

The unhealthy food score of excessive weight loss concerns group is relatively low (6.25/15) in comparison to other groups of appropriate and insufficient concerns. It is worrying that a group of healthy-weight children with extreme concerns of losing weight are using this amount of unhealthy food items.

The answers for the healthy food consumption of healthy-weight children were confusing. Even though most of the children answered the questions about their consumption of four out of the five items used to calculate the healthy food score, none of them gave an answer about their consumption of the fifth item (wholemeal bread). Thus, the healthy food score could not be calculated properly. This limits further analysis concerning healthy-weight children's consumption of healthy food items.

Moreover it was suggested by Newman that children are more likely to restrict their consumption of unhealthy food items, rather than increase their consumption of healthy food items (2008). Therefore more attention should be given to the importance of healthy diets and food items consumed among school children.

4.2.2 Skipping breakfast

On a positive note, this study found that 100 % of participants had breakfast. This is a massive reduction in percentages of skipping breakfast, in comparison to previous studies. One of them was conducted on adolescents and found that 20% of females and 13 % of males often skip breakfast (O'Dae & Abraham, 2001). And another found that 32 % of all participated adolescents skipped breakfast (Malinauskas et al., 2006).

Daily breakfast consumption might be positively correlated with body image satisfaction (Arora, 2012). Therefore, it can be argued that children with low body satisfactions and inappropriate excessive weight loss concerns tend to use the breakfast- skipping habit as a weight reduction method and a change in lifestyle (Zullig et al., 2006).

Breakfast is an essential meal, and has a great value with regards to its nutritional importance. Considering this value, many studies examined breakfast consumption/skipping effects on health and total energy intake. One Italian study suggested that breakfast might be an important determinant in improving cognitive functioning and academic performances of school children (Affinita et al., 2013), Boschloo et al., (2012) also mentioned that breakfast skippers are more likely to have poorer performance at school than breakfast consumers, this was tested on all adolescents across genders and years. In the same line of previous studies, it was shown that skipping breakfast could be significantly related to low fruits and vegetables consumption (Lazzeri et al., 2013). Additionally, it was suggested that the total hip bone mineral density might be three or more times lower in breakfast skippers (Kuroda et al., 2013). This might be directly correlated with a

study, which finds that consuming breakfast could increase the total body's Calcium means, Vitamin D and dairy product intake (Peters et al., 2012).

After these findings, which confirm the importance of breakfast and the unhealthy consequences of missing it, health institutes and professionals were alarmed, and pushed to reduce the percentages of skipping breakfast, especially among school children. For this reason, thousands of health campaigns and interventions were done worldwide. One of the institutes conducted a campaign around Europe; called "Breakfast is best". This campaign has its own website, which includes information about breakfast importance, tips, challenges, and other news. In the United Kingdom for example, there is a special approach to increase breakfast consumption called "BREAKFAST CLUBS AND SCHOOL FRUIT SCHEMES", which provide free and nutritious breakfast food through schools (the ESRC funded initiative, 2006).

Accordingly, it is not surprising to get a very small percentage of breakfast skippers among school children in this study. One study was conducted 4-years ago by Newman, and found that 22.6% of children skipped breakfast, in comparison to 0 % of breakfast skippers in this study, and this includes all students of healthy-weight and non- healthy weight.

4.2.3 Dairy Avoidance

Findings of this study showed that the minority of all participants avoided consumption of dairy products from their diet, which counts for only three percent of avoidance (n=212 out of 7003). Therefore, it can be assumed that popular awareness of the importance of dairy products -as a main item in their regular diet-

has been greatly increased over the years. The results also specified that males were more likely to avoid dairy consumption in comparison to females. And younger children in year 8 had higher percentages in avoiding milk products than older ones. This is not what previous studies found. A study by Phillips et al. (2003) suggested that dairy consumption decreases with age.

School children tend to abstain from dairy their daily diet, as part of their weight loss strategy (Dragone & Savorelli, 2012). This is probably because of misinterpretation of weight control practices - as some diets include the substitution of whole fat milk with a skimmed one -, or might also be due to the lack of certain nutritional information. This approach is wrong, as one of the studies proved that there is no significant difference on either body weight or body composition when reducing/removing dairy from diet (Zemel et al., 2008).

In 2006, The British Dietetic Association recommended the consumption of two to four servings of dairy and its products per day. But this recommendation is increased nowadays to at least four servings a day (BDA Teens Weight Wise). This might be because of the findings of the essential role the dairy products play on maintaining human health and wellbeing. In 2012, it was found that the increase in dairy intake could significantly increase total body levels of calcium and vitamin D (Peters et al.). And this might eventually increase calcium: phosphorus ratio, which could also reduce the incidence of central obesity depending on waist to hip ratio (Pereira et al., 2013). Another study suggested that high dairy products consumption may improve plasma insulin and insulin resistance compared to low dairy consumption (Rideout et al., 2013).

The decision to avoid dairy products would be very harmful to a group of people like school children and mainly females, since puberty is a crucial stage for growth, bone-building and improving adolescent's bone mineral density (Kim et al., 2013). Additionally, consuming more than three servings of milk products daily might have a positive effect on total nutritional status, and might also be associated with reducing blood pressure (Rice et al., 2013).

In this study, healthy-weight children with different weight related concerns were further divided into two groups of dairy consumption or avoidance. Children in insufficient weight loss concerns group had zero percentage among dairy avoidance group, which might not be surprising, as this group has the least concern of using dairy removal as a weight reduction method. The group of dairy avoidance is split in two halves, one is the healthy-weight children with excessive weight loss concern (50 %) and another is for healthy-weight children with appropriate weight loss concerns. It was expected that children with excessive concerns might use this weight loss practice in a higher percentages than others.

Surprisingly, in the missing answers manner, 77.3 percent of all healthy-weight participants did not provide an answer to whether or not they consume dairy products. Almost fifty percent of them were in the appropriate weight loss concerns group. The only possible explanation of this is that some children are not aware of all dairy products included in the dairy group, other than cheese and milk, which are mentioned as examples in the questionnaire.

4.3 Physical activity

Although adolescents' physical activity levels have increased over the last past years (Ronald et al., 2013), this study reveals the opposite results, as almost 30 % of participating children did not exercise sufficiently - three or more a days per week-. This study also found that activity insufficiency was mostly found among year 10 children and females, which is supported in previous studies with the same results (Cuenca-Garcia et al., 2013).

It is recommended that all school children and young adolescents be engaged in a regular physical activity regimen for at least sixty minutes per day, and it might vary from moderate to intensive exercising (department of health, 2011). Physical activity, mainly during childhood, has a big influence on both immediate and long-term effects (department of health, 2011). Its positive effect might be enclosed in adiposity, cardiovascular, bone, skeletal health and more desirable psychological changes (Loprinziet al, 2012). It might also play a positive role in improving the child's nutritional status (Da Silva et al., 2013). Additionally, Physical activity could increase the child's social interaction, improve child's motivation, challenge spirit and competence, in addition to reduction weight.

For a long time, physical activity was incorporated with weight management and weight loss interventions among overweight people; therefore it is misused by a large scale of population, including school children and young adolescents, and specifically the ones with excessive weight loss concerns. They tend to use physical activity extensively to lose weight. One study showed that 80% of adolescent participants used physical activity as weight loss management, and only 19% of them achieve weight loss (Malinauskas et al., 2006).

23 % of the group of healthy-weight children in this study did not do sufficient exercising. Specifically, the highest percentage of insufficiently exercising was among children with excessive weight loss concerns, and the lowest in the group of insufficient concerns.

Obtaining these high percentages of physical activity insufficiency, among children with excessive weight loss concerns, was unpredicted. That was especially true given that this group might use exercise as a weight loss technique (Quiles-Marcos et al., 2011). One study suggested an explanation of this result: when healthy-weight children are exposed to any type of teasing, with regards to their shape or weight -especially with their low body satisfaction- their physical activity will be reduced for one year afterwards. And teasing has a greater effect on healthy weight children than overweight or obese ones (Chad et al., 2013).

As a result, more attention should be given to the psychological experiences of this group of children, to assure better quality of life, and to reduce the incidence of decreasing physical activities engagements.

4.4 Strengths and Limitations

4.4.1 Strengths

The results of this study may be generalized to include almost all children population in years 8 and 10 (age 13-16) across the United Kingdom and Wales, considering that the study sample covered a wide-scale of ethnicities, ages, genders and socioeconomic statuses. It can also be argued that the health-

related behaviour questionnaire, used in this study, was comprehensive enough for the purpose of this project, regarding weight loss concerns and eating behaviours. Additionally, data were conveniently collected and entered into the SPSS program. This had greatly made it easier to create new variables and analysis.

4.4.2 Limitations

4.4.2.1 Limitations of this study

This study used a secondary data, collected by SHEU. This made it slightly more difficult to determine certain behaviours, such as physical activity levels among participants, as the question used for that could be considered general.

Moreover, the dependence on year 8 and year 10 school children, for determining dietary practices for younger and older children, could also cause an error. Because the characteristics of these children (years 8 and 10) are almost the same, and by that the dietary approaches will not be varied as it does vary among children with bigger age gap.

Relying on self-reported weight and height to calculate body mass index may lead to it being underestimated. One study assessed the validity of self-reporting measures and revealed that children - mainly females- are more likely to overestimate their height and underestimate their weight, which results in an underestimation of body mass index (Landsberg, 2011). This might affect this study by means of expanding the healthy- weight children group, because of the underestimated BMI of some overweight children. This might

also increases the number of children in excessive weight loss concerns group, and eventually influence the outcomes.

Healthy and unhealthy food scores were calculated based on children's consumption of a specific food items, as per the questionnaire. But the items used to calculate food scores were not broad enough to determine the healthiness/un-healthiness of a child's diet. For example, the "meat" group and fast-food frequency consumption was not included. Moreover, the analysis tests used to calculate food scores wasn't flexible enough. As missing answer on one or more of the food items used leaves an empty cell, which might be considered an error. For instance, all healthy-weight children did not answer the question regarding consumption of wholemeal bread- which is one of the five items used to calculate healthy food score. Therefore, the calculation of their healthy food score was corrupted.

4.4.2.2 Choices made during research progress

One problem was dealing with missing data. Some participants didn't answer several questions for different reasons, such as not being able to understand. List- wise deletion method; which depends on filtering out participants - who missed answering on a specific question- entirely from the study (Field, 2013). This method was only used for missing answers on weight and height. Although this method reduced the total number of participants to only one fifth of the original sample, increased the incidence of bias and might have affected the sample diversity, the answers on participant's weight and height were essential to complete the research. On the other hand, the other deletion method used, the case-wise method, filters out participants only from the questions

they have not answered (Field, 2013). This method was very useful, as it decreases the number of lost participants.

4.4.2.3 How to overcome these limitations in future studies

One important measure that proves useful in facilitating and completing research, is employing trained people to help collect data. This will reduce the number of cases with missing answers, and will prevent the errors that might occur because of self-reporting.

This study identified the percentages of dietary practices among healthy-weight children with different weight loss desires. Therefore, future studies could give more attention to the long-term effects of these unhealthy practices. They could also follow the same group of participants to detect the consequences of their dietary practices.

4.5 Recommendations

For a long period of time, overweight children were the main attention group of health organizations' work and campaigns. These organizations focused on these children's dieting practices, dietary approaches, losing weight interventions and other aspects (WHO, 2012). Results of this study could shift the attention of these organizations toward excessive weight-related concerns group, which will eventually increase the number of health campaigns that target this group.

4.5.1 Health campaigns

Health campaigns, which employ a variety of approaches such as workshops, lectures, billboards, posters, etc., might help decrease the percentage of excessive weight related concern group in the society as a whole. This can be done by spreading this research message, which spotlights the unhealthy dieting practices and some of the possible - short and long terms- consequences. Dairy avoidance is one example of a practice that health campaigns could focus on, as school children use this practice as a dieting approach. Raising awareness among children and families regarding the grave health consequences of missing dairy, an essential part of a child's diet, is both very important and effective. This has been proved by studies, one of which points out that the lack of milk consumption during childhood might increase future risk of osteoporosis (Garabedian, 2006).

Previous studies showed the strong relationship between health beliefs and media. Recently, media plays an important role in spreading the image of thinness as the ideal body figures, especially for females (Chang, 2013). Because adolescents are heavy users of different types of media, primarily social media, this idea of the thin body as being "perfect" is predominant in their minds; and as this study shows, school children found different methods to achieve that image. Therefore, it might be a good idea to form partnerships with health institutes and media platforms (NHS, 2004), in order to increase the scope of the message, and limit the reach of misleading ideas about body image.

4.5.2 Body dissatisfaction

One of the main reasons behind school children's unhealthy dieting practices is their body image dissatisfaction and/or their obsessive fear of gaining weight. Because these two factors are directly related to psychology, it could be beneficial to invite guest speakers to schools; as they could talk about their past experiences in losing weight, eating disorders, or any other diseases. They might also mention how they overcame these conditions (Husebscher, 2010). Moreover, it was suggested that body satisfactions is associated with self-esteem. Therefore, small groups of counselling could be formed at schools; to discuss different health aspects, such as friendships, body image,... etc. These groups would aim to effectively increase a child's positive self-esteem (Husebscher, 2010), especially that they would take a place in an environment where the child is getting exposed to possible body-related teasing. In fact, some adolescents cited poor nutritional information, unsupportive schools environment and time mismanagement as barriers to regular healthy eating practices. For this reason, gender- specific discussion sessions and educational activities about these issues might be helpful (Thomas & Irwin, 2009).

4.5.3 Ideal body weight

The size of models decreased significantly in the past decade, which leads to a shrinkage in the ideal body weight (Sypeck et al., 2004). The current ideal body weight is less than the average of healthy body weight. As a result it was suggested that the ideal body weight needs to be increased (Dragone & Savorelli, 2012).

Although this idea is very general, and it depends on the exact suggested body weight, but it might still be effective.

4.5.4 Future studies

This research could be used as reference research for future studies. For example, more investigation could be done on the role of media, specifically on appropriateness of weight concerns for school children and adolescents, since this research categorises different concerns and a range of dieting behaviours. More studies like the exact cost effectiveness of early diagnosis of eating disorders could also be appropriate.

4.6 Conclusion

The current study found that more than half of participating children are healthy- weight. They were divided into three groups of different weight- related desires. Almost 40 % of them were in the excessive weight loss concerns, and only 10 % were in the insufficient weight loss concerns.

Gender and age had an influence on weight loss desires and dietary practices. Females and older children were more likely to have excessive weight loss concern than males or younger participants. This study also revealed that weight loss desires play a role in determining some dietary behaviours among school children. As children with excessive weight loss concerns tend to do least exercising in comparison to other groups. However, the desire to lose weight did not affect the percentages of diary avoidance or breakfast skipping. On a positive note, children with excessive

weight loss concerns had the least consumption of unhealthy food items.

It is clear that the tendency of losing weight is increasing throughout the years, especially among healthy weight adolescents. Therefore, more efforts should be done to increase body image awareness among children and families. These should focus on countering prevalent imagery of thinness as an ideal, and addressing weight loss desires appropriateness, and specifically eating behaviours.

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APPENDECIES

Appendix 1:



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DATA SHARING AGREEMENT

AGREEMENT BETWEEN SHEU AND *Ola Anabtawi*...

REGARDING DATA FILES:

Data from Aggregate school databank 2010

AGREEMENT OF PURPOSE

1. The data supplied to me will be used only for the purpose(s) set out below:

... *MSc - Master of Science research project* ...

2. The information will be processed in accordance with the principles and conditions set out in the Data Protection Act 1998 and with proper safeguards to ensure confidentiality.
3. The data are only used for research purposes relating to the current study and are not shared with, or communicated to, anyone other than the project team and will be deleted at the conclusion of the study.

CONFIDENTIALITY

4. Good practice relating to confidentiality, use of project data, copyright and the dissemination of findings are not contravened. In particular, no school will be identified in any reporting from this study.
5. No contact will be made with any individual(s) that could be identified from the information supplied. Any reports, papers or statistical tables that are published or released to other organisations will fully protect the identity of individuals in accordance with current DPA guidance. Where there is doubt about the implications to a particular situation, the advice of SHEU will be sought.
6. No attempt will be made to link the information supplied to any other data relating to identifiable individuals without the prior approval of SHEU. The prior agreement of SHEU will also be sought for any extension of this work beyond what was originally made known to SHEU, if it involves the use of data supplied or derived from that supplied by SHEU.

DATA SECURITY

7. The data are held securely and in the strictest confidence, and all data held electronically are protected by the use of passwords.

8. All information supplied by SHEU and any copies will be destroyed if it is no longer required for the purposes for which it was supplied.
9. Any person who has access to the records supplied will also be required to abide by the terms in this agreement. [The signature of the person responsible for agreeing to these conditions is appended.]
10. The data are held securely and in the strictest confidence, and all data held electronically are protected by the use of passwords and firewalls as appropriate.

PUBLISHING

11. The information will not be released to any other individual(s) or organisation(s) not directly connected with the work specified in this agreement (except in the form of statistical tables or conclusions) without prior approval of SHEU.
12. Proper acknowledgement is given in any publication or presentation to the SHEU for the use of the data. Where appropriate, drafts and copies of papers will be supplied to SHEU.
13. The Health-Related Behaviour Questionnaires are copyright John Balding/SHEU. These questionnaires are not to be reproduced in whole or in part without permission from SHEU.

I am satisfied with the above arrangements for the supply and processing of data according to the above conditions.

Name: Dr. David Regis

Position: Research Manager

Organisation: SHEU, Exeter

Signed:

Date:

I undertake to ensure that the data supplied by SHEU and placed in my care is processed according to the above conditions.

Name: *Ola Anabtawi*

Position: *Project Student*

Organisation: *University of Nottingham*

Signed: *[Signature]*

Date: *08/01/2014*

Appendix 2:

Syntax used for data screening and analysis:

1. Filtering out cases with missing height or weight values

```
COMPUTE miss =0.
```

```
IF MISSING (HEIGHT) OR MISSING (WEIGHT) miss = 1.
```

```
EXECUTE.
```

2. Filtering out cases with missing answers on weight loss desire

```
COMPUTE Miss_typwght = MISSING (WtLOSSDES).
```

```
EXECUTE.
```

3. BMI Calculation

```
COMPUTE BMI = (WEIGHT / (HEIGHT/100)**2).
```

```
EXECUTE.
```

4. new Variable of weight classification

```
IF ((Age GE 11.75 AND Age <12.25) AND sex = 0 AND bmi LE 15.35) wt_class = 1.
```

```
IF ((Age GE 12.25 AND Age <12.75) AND sex = 0 AND bmi LE 15.58) wt_class = 1.
```

```
IF ((Age GE 12.75 AND Age <13.25) AND sex = 0 AND bmi LE 15.84) wt_class = 1.
```

```
IF ((Age GE 13.25 AND Age <13.75) AND sex = 0 AND bmi LE 16.12) wt_class = 1.
```

```
IF ((Age GE 13.75 AND Age <14.25) AND sex = 0 AND bmi LE 16.41) wt_class = 1.
```

```
IF ((Age GE 14.25 AND Age <14.75) AND sex = 0 AND bmi LE 16.69) wt_class = 1.
```

```
IF ((Age GE 14.75 AND Age <15.25) AND sex = 0 AND bmi LE 16.98) wt_class = 1.
```

```
IF ((Age GE 15.25 AND Age <15.75) AND sex = 0 AND bmi LE 17.26) wt_class = 1.
```

```
IF ((Age GE 15.75 AND Age <16.25) AND sex = 0 AND bmi LE 17.54) wt_class = 1.
```

IF ((Age GE 11.75 AND Age <12.25) AND sex = 1 AND bmi LE 15.62) wt_class = 1.

IF ((Age GE 12.25 AND Age <12.75) AND sex = 1 AND bmi LE 15.93) wt_class = 1.

IF ((Age GE 12.75 AND Age <13.25) AND sex = 1 AND bmi LE 16.26) wt_class = 1.

IF ((Age GE 13.25 AND Age <13.75) AND sex = 1 AND bmi LE 16.57) wt_class = 1.

IF ((Age GE 13.75 AND Age <14.25) AND sex = 1 AND bmi LE 16.88) wt_class = 1.

IF ((Age GE 14.25 AND Age <14.75) AND sex = 1 AND bmi LE 17.18) wt_class = 1.

IF ((Age GE 14.75 AND Age <15.25) AND sex = 1 AND bmi LE 17.45) wt_class = 1.

IF ((Age GE 15.25 AND Age <15.75) AND sex = 1 AND bmi LE 17.69) wt_class = 1.

IF ((Age GE 15.75 AND Age <16.25) AND sex = 1 AND bmi LE 17.91) wt_class = 1.

IF ((Age GE 11.75 AND Age <12.25) AND sex = 0 AND (bmi > 15.35 AND bmi < 21.22)) wt_class = 2.

IF ((Age GE 12.25 AND Age <12.75) AND sex = 0 AND (bmi > 15.58 AND bmi < 21.56)) wt_class = 2.

IF ((Age GE 12.75 AND Age <13.25) AND sex = 0 AND (bmi > 15.84 AND bmi < 21.91)) wt_class = 2.

IF ((Age GE 13.25 AND Age <13.75) AND sex = 0 AND (bmi > 16.12 AND bmi < 22.27)) wt_class = 2.

IF ((Age GE 13.75 AND Age <14.25) AND sex = 0 AND (bmi > 16.41 AND bmi < 22.62)) wt_class = 2.

IF ((Age GE 14.25 AND Age <14.75) AND sex = 0 AND (bmi > 16.69 AND bmi < 22.96)) wt_class = 2.

IF ((Age GE 14.75 AND Age <15.25) AND sex = 0 AND (bmi > 16.98 AND bmi < 23.29)) wt_class = 2.

IF ((Age GE 15.25 AND Age <15.75) AND sex = 0 AND (bmi > 17.26 AND bmi < 23.60)) wt_class = 2.

IF ((Age GE 15.75 AND Age <16.25) AND sex = 0 AND (bmi > 17.54 AND bmi < 23.90)) wt_class = 2.

IF ((Age GE 11.75 AND Age <12.25) AND sex = 1 AND (bmi > 15.62 AND bmi < 21.68)) wt_class = 2.

IF ((Age GE 12.25 AND Age <12.75) AND sex = 1 AND (bmi > 15.93 AND bmi < 22.14)) wt_class = 2.

IF ((Age GE 12.75 AND Age <13.25) AND sex = 1 AND (bmi > 16.26 AND bmi < 22.58)) wt_class = 2.

IF ((Age GE 13.25 AND Age <13.75) AND sex = 1 AND (bmi > 16.57 AND bmi < 22.98)) wt_class = 2.

IF ((Age GE 13.75 AND Age <14.25) AND sex = 1 AND (bmi > 16.88 AND bmi < 23.34)) wt_class = 2.

IF ((Age GE 14.25 AND Age <14.75) AND sex = 1 AND (bmi > 17.18 AND bmi < 23.66)) wt_class = 2.

IF ((Age GE 14.75 AND Age <15.25) AND sex = 1 AND (bmi > 17.45 AND bmi < 23.94)) wt_class = 2.

IF ((Age GE 15.25 AND Age <15.75) AND sex = 1 AND (bmi > 17.69 AND bmi < 24.17)) wt_class = 2.

IF ((Age GE 15.75 AND Age <16.25) AND sex = 1 AND (bmi > 17.91 AND bmi < 24.37)) wt_class = 2.

IF ((Age GE 11.75 AND Age <12.25) AND sex = 0 AND (bmi GE 21.22 AND bmi < 26.02)) wt_class = 3.

IF ((Age GE 12.25 AND Age <12.75) AND sex = 0 AND (bmi GE 21.56 AND bmi < 26.43)) wt_class = 3.

IF ((Age GE 12.75 AND Age <13.25) AND sex = 0 AND (bmi GE 21.91 AND bmi < 26.84)) wt_class = 3.

IF ((Age GE 13.25 AND Age <13.75) AND sex = 0 AND (bmi GE 22.27 AND bmi < 27.25)) wt_class = 3.

IF ((Age GE 13.75 AND Age <14.25) AND sex = 0 AND (bmi GE 22.62 AND bmi < 27.63)) wt_class = 3.

IF ((Age GE 14.25 AND Age <14.75) AND sex = 0 AND (bmi GE 22.96 AND bmi < 27.98)) wt_class = 3.

IF ((Age GE 14.75 AND Age <15.25) AND sex = 0 AND (bmi GE 23.29 AND bmi < 28.30)) wt_class = 3.

IF ((Age GE 15.25 AND Age <15.75) AND sex = 0 AND (bmi GE 23.60 AND bmi < 28.60)) wt_class = 3.

IF ((Age GE 15.75 AND Age <16.25) AND sex = 0 AND (bmi GE 23.90 AND bmi < 28.88)) wt_class = 3.

IF ((Age GE 11.75 AND Age <12.25) AND sex = 1 AND (bmi GE 21.68 AND bmi < 26.67)) wt_class = 3.

IF ((Age GE 12.25 AND Age <12.75) AND sex = 1 AND (bmi GE 22.14 AND bmi < 27.24)) wt_class = 3.

IF ((Age GE 12.75 AND Age <13.25) AND sex = 1 AND (bmi GE 22.58 AND bmi < 27.76)) wt_class = 3.

IF ((Age GE 13.25 AND Age <13.75) AND sex = 1 AND (bmi GE 22.98 AND bmi < 28.20)) wt_class = 3.

IF ((Age GE 13.75 AND Age <14.25) AND sex = 1 AND (bmi GE 23.34 AND bmi < 28.57)) wt_class = 3.

IF ((Age GE 14.25 AND Age <14.75) AND sex = 1 AND (bmi GE 23.66 AND bmi < 28.87)) wt_class = 3.

IF ((Age GE 14.75 AND Age <15.25) AND sex = 1 AND (bmi GE 23.94 AND bmi < 29.11)) wt_class = 3.

IF ((Age GE 15.25 AND Age <15.75) AND sex = 1 AND (bmi GE 24.17 AND bmi < 29.29)) wt_class = 3.

IF ((Age GE 15.75 AND Age <16.25) AND sex = 1 AND (bmi GE 24.37 AND bmi < 29.43)) wt_class = 2.

IF ((Age GE 11.75 AND Age <12.25) AND sex = 0 AND bmi GE 26.02) wt_class = 4.

IF ((Age GE 12.25 AND Age <12.75) AND sex = 0 AND bmi GE 26.43) wt_class = 4.

IF ((Age GE 12.75 AND Age <13.25) AND sex = 0 AND bmi GE 26.84) wt_class = 4.

IF ((Age GE 13.25 AND Age <13.75) AND sex = 0 AND bmi GE 27.25) wt_class = 4.

IF ((Age GE 13.75 AND Age <14.25) AND sex = 0 AND bmi GE 27.63) wt_class = 4.

IF ((Age GE 14.25 AND Age <14.75) AND sex = 0 AND bmi GE 27.98) wt_class = 4.

IF ((Age GE 14.75 AND Age <15.25) AND sex = 0 AND bmi GE 28.30) wt_class = 4.

IF ((Age GE 15.25 AND Age <15.75) AND sex = 0 AND bmi GE 28.60) wt_class = 4.

IF ((Age GE 15.75 AND Age <16.25) AND sex = 0 AND bmi GE 28.88) wt_class = 4.

IF ((Age GE 11.75 AND Age <12.25) AND sex = 1 AND bmi GE 26.67) wt_class = 4.

IF ((Age GE 12.25 AND Age <12.75) AND sex = 1 AND bmi GE 27.24) wt_class = 4.

IF ((Age GE 12.75 AND Age <13.25) AND sex = 1 AND bmi GE 27.76) wt_class = 4.

IF ((Age GE 13.25 AND Age <13.75) AND sex = 1 AND bmi GE 28.20) wt_class = 4.

IF ((Age GE 13.75 AND Age <14.25) AND sex = 1 AND bmi GE 28.57) wt_class = 4.

IF ((Age GE 14.25 AND Age <14.75) AND sex = 1 AND bmi GE 28.87) wt_class = 4.

```
IF ((Age GE 14.75 AND Age <15.25) AND sex = 1 AND bmi GE 29.11) wt_class = 4.
```

```
IF ((Age GE 15.25 AND Age <15.75) AND sex = 1 AND bmi GE 29.29) wt_class = 4.
```

```
IF ((Age GE 15.75 AND Age <16.25) AND sex = 1 AND bmi GE 29.43) wt_class = 4.
```

```
VARIABLE LABEL wt_class 'Weight Classification'.
```

```
VALUE LABELS wt_class 1 'Underweight' 2 'Healthy' 3 'Overweight' 4 'Obese'.
```

```
EXECUTE.
```

```
IF (wt_class = 2 AND WtLOSSDES = 1) ola_wt_desires = 0.
```

```
IF (wt_class = 2 AND WtLOSSDES = 2) ola_wt_desires = 1.
```

```
IF (wt_class = 2 AND WtLOSSDES = 0) ola_wt_desires = 2.
```

```
EXECUTE
```

5. Chi squared imdependent test between weight classification and Missing Height and weight

```
CROSSTABS
```

```
  /TABLES=wt_class BY miss_typwght
```

```
  /FORMAT= AVALUE TABLES
```

```
  /STATISTIC=CHISQ
```

```
  /CELLS= COUNT EXPECTED ROW
```

```
  /COUNT ROUND CELL .
```

6. New Variable of Skipping breakfast

```
COMPUTE skipping_breakfast = 0.
```

```
IF (breknoth = 1 & (brektost = 0 & breksnak = 0 & brekbar = 0 & brekdrnk = 0 & brekcook = 0 & brekchoc = 0 & brekbisc = 0 &
```

```
  brekcer = 0 & brekfru = 0 & brekyog = 0 & brekcake = 0 & brekothr = 0)
```

```
  or (brekdrnk = 1 & (breknoth = 0 & brektost = 0 & breksnak = 0 & brekbar = 0 & brekcook = 0 & brekchoc = 0 & brekbisc = 0 &
```

```
  brekcer = 0 & brekfru = 0 & brekyog = 0 & brekcake = 0 & brekothr = 0 ))) skipping_breakfast = 1.
```

```
VARIABLE LABEL skipping_breakfast 'Skipping breakfast'.
```

```
EXECUTE .
```

7. New variable for skipping breakfast inconsistencies

```
COMPUTE incons_rel = 0.
```

```
IF(breknoth = 1 & (brekdrnk = 1 or brekcer = 1 or brekbisc = 1 or brekcake = 1  
or brektost = 1 or brekfru = 1 or brekyog = 1 or breksnak = 1 or brekchoc = 1  
or brekbar = 1 or brekcook =1 or brekothr = 1)) incons_rel = 1.
```

```
IF(breknoth = 0 & (brekdrnk = 0 & brekcer = 0 & brekbisc = 0 & brekcake = 0  
& brektost = 0 & brekfru = 0 & brekyog = 0 & breksnak = 0 & brekchoc = 0 &  
brekbar = 0 & brekcook = 0 & brekothr = 0)) incons_rel = 1.
```

```
VARIABLE LABEL incons_rel 'Inconsistencies between variables'.
```

```
VALUE LABEL incons_rel 1 'Inconsistencies between breakfast variables' 0 'No  
inconsistencies between breakfast variables'.
```

8. Filter out missing data on skipping breakfast

```
COMPUTE miss_break = 0.
```

```
IF (MISSING (breknoth) OR MISSING (brekdrnk) OR MISSING (brekcer) OR  
MISSING (brekbisc) OR MISSING (brekcake) OR MISSING (brektost) OR  
MISSING (brekfru) OR MISSING (brekyog) OR MISSING (breksnak) OR MISSING  
(brekchoc) OR MISSING (brekbar) OR MISSING (brekcook) OR MISSING  
(brekothr)) miss_break = 1.
```

```
IF ((breknoth = 9) OR (brekdrnk = 9) OR (brekcer = 9) OR (brekbisc = 9) OR  
(brekcake = 9) OR (brektost = 9) OR (brekfru = 9) OR (brekyog = 9) OR  
(breksnak = 9) OR (brekchoc = 9) OR (brekbar = 9) OR (brekcook =9) OR  
(brekothr = 9)) miss_break = 1.
```

```
VARIABLE LABEL miss_break 'Missing values on breakfast'.
```

```
VALUE LABELS miss_break 1 'Missing value on breakfast' 0 'No missing value on  
breakfast'.
```

```
EXECUTE.
```

9. Chi squared independent test between Skipping breakfast variable and weight- related Desires

```
CROSSTABS
```

```
/TABLES= skipping_breakfast BY ola_wt_desires
```

```
/FORMAT=AVALUE TABLES
```

```
/STATISTICS=CHISQ
```

```
/CELLS=COUNT EXPECTED ROW
```

```
/COUNT ROUND CELL
```

10. New variable for HFS (Healthy Food Score)

COMPUTE

healthy_food = whobeat + braneat + saleat + ffrueat + vegeat.

VARIABLE LABEL healthy_food 'Healthy Food Score'.

EXECUTE.

11. Filter out missing data of HFS

COMPUTE miss_healthy = 0.

IF (MISSING (whobeat) OR MISSING (braneat) OR MISSING (saleat) OR
MISSING (ffrueat) OR MISSING (vegeat) OR (whobeat = 9) OR (whobeat = 6)
OR (braneat = 9) OR (saleat = 9) OR (ffrueat = 9) OR (vegeat = 9))
miss_healthy = 1.

VARIABLE LABEL miss_healthy 'Missing values for healthy food score'.

VALUE LABEL miss_healthy 1 'Missing values for healthy food score' 0 'No
missing values for healthy food score'.

EXECUTE.

12. New variable for UHFS (Unhealthy Food Score)

COMPUTE

unhealth_food = chipeat + sugceat + fizzeat + crspeat + sweeteat.

VARIABLE LABEL unhealth_food 'Unhealthy Food score'.

EXECUTE.

13. Filter out missing data of UHFS

COMPUTE miss_unhealthy = 0.

IF (MISSING (chipeat) OR MISSING (sugceat) OR MISSING (fizzeat) OR
MISSING (crspeat) OR MISSING (sweeteat) OR (chipeat = 9) OR (sugceat = 9)
OR (fizzeat = 9) OR (crspeat = 9) OR (sweeteat = 9)) miss_unhealthy = 1.

VARIABLE LABEL miss_unhealthy 'Missing values for unhealthy food score'.

VALUE LABEL miss_unhealthy 1 'Missing values for unhealthy food score' 0 'No
missing values for unhealthy food score'.

EXECUTE.

14. Chi squared independent test between sex and Missing Height and weight

CROSSTABS

/TABLES=SEX BY miss

/FORMAT=AVALUE TABLES

/STATISTICS=CHISQ

/CELLS=COUNT EXPECTED ROW

/COUNT ROUND CELL

15. Chi squared independent test between Year group and Missing Height and weight

CROSSTABS

/TABLES= YEAR BY miss

/FORMAT=AVALUE TABLES

/STATISTICS=CHISQ

/CELLS=COUNT EXPECTED ROW

/COUNT ROUND CELL

16. Chi squared independent test between sex and Missing typwght

CROSSTABS

/TABLES=sex BY Miss_typwght

/FORMAT=AVALUE TABLES

/STATISTICS=CHISQ

/CELLS=COUNT EXPECTED ROW

/COUNT ROUND CELL

17. Chi squared independent test between year and Missing typwght

CROSSTABS

/TABLES=YEAR BY Miss_typwght

/FORMAT=AVALUE TABLES

/STATISTICS=CHISQ

/CELLS=COUNT EXPECTED ROW

/COUNT ROUND CELL

18. Chi squared independent test between sex and weight loss desire appropriateness

```
CROSSTABS  
/TABLES=sex BY ola_wt_desires  
/FORMAT=AVALUE TABLES  
/STATISTICS=CHISQ  
/CELLS=COUNT EXPECTED ROW  
/COUNT ROUND CELL
```

19. Chi squared independent test between sex and weight loss desire appropriateness

```
CROSSTABS  
/TABLES= YEAR BY ola_wt_desires  
/FORMAT=AVALUE TABLES  
/STATISTICS=CHISQ  
/CELLS=COUNT EXPECTED ROW  
/COUNT ROUND CELL
```

20. filter missing or unrealistic values of dairy consumption

```
COMPUTE Missing_dairycon = 0.  
IF (MISSING (DAIRYEAT) OR (DAIRYEAT = 6) OR (DAIRYEAT = 9))  
Missing_dairycon = 1.  
EXECUTE
```

20. Creating a new variable for dairy avoidance

```
COMPUTE dairy_avoidance =1  
IF (DAIRYEAT = 0) dairy_avoidance = 1  
VARIABLELABEL dairy_avoidance 'Dairy Avoidance'  
VALUE LABEL dairy_avoidance 1 'Dairy Avoidance' 0 'Consume Dairy'  
EXECUTE
```

21. Create New variable for missing value of dairy avoidance

```
COMPUTE Missing_dairyavo = 0.
```

```
IF ( MISSING (dairy_avoidance)) Missing_dairy = 1.
```

```
EXECUTE
```

22. Create Physical Activity New Variable.

```
COMPUTE PUFF2 = 1.
```

```
IF (PUFFEDFQ LE 2) PUFF2 = 0.
```

```
EXECUTE
```

23. Filter missing data on PUFF2

```
COMPUTE Missing_Phy = 0.
```

```
IF (MISSING (PUFFEDFQ) OR (PUFFEDFQ=9)) Missing_Phy = 1.
```

```
EXECUTE
```

24. Physical activity levels among children with different weigh-related concerns

```
CROSSTABS
```

```
/TABLES= PUFF2 BY ola_wt_desires
```

```
/FORMAT=AVALUE TABLES
```

```
/STATISTICS=CHISQ
```

```
/CELLS=COUNT EXPECTED ROW
```

```
/COUNT ROUND CELL
```