Professional Doctorate in

Health Psychology

Thesis Portfolio

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Contents

Acknowledgements

It is my pleasure to acknowledge a few individuals who were helpful during my completion of my training as a Health Psychologist.

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Declaration

I, Helena Wehling, grant powers of discretion to the University Librarian to allow this thesis to be copied in whole or in part without further reference to me. This permission covers only single copies made for study purposes, subject to normal conditions of acknowledgement.

Preface

This portfolio outlines the five competencies that formulate the Health Psychology Professional Doctorate. The competencies are outlined by the British Psychological Society (BPS, 2009) and include the following: research via the completion of an original piece of research and a systematic review of existing literature; the development and evaluation of a consultancy; the development and evaluation of a health behaviour intervention; an evaluation of a taught lecture and review of the professional skills gained whilst completing the doctorate.

Throughout completing the doctorate, I evolved from landing a job as an Assistant Health Psychology Specialist at the very beginning into being promoted to a Health Psychology Specialist towards the end of my training. Before I was offered my first job in April 2015, I engaged in voluntary work with patients as well as doing an internship for an interventional trial at King's College London, until I was offered a full-time job role in a commercial agency who were specialised in developing patient support programmes across a wide range of chronic conditions for many of the leading international pharmaceutical companies. As there was a strong focus on international collaborations both internally and with many clients being located in central Europe, my role then expanded to additionally becoming the representative Health Psychology Specialist for the German office in Frankfurt. In my role as a Health Psychology Specialist I additionally had the opportunity to deliver training sessions to postgraduate pharmacist students as part of their curriculum on various occasions, which entailed applying behavior change techniques with their patients. The focus was on underlying psychology theories to underpin the identification of factors impacting on behaviours around illness and treatment self-management and adherence, and how these may be addressed using a viable interventional approach, for example elements derived from Motivational Interviewing or Cognitive Behavioural Theory.

My external consultancy project in the context of my doctorate training

exposed me to the working practices in a different agency, which was important for me in order to be able to adapt to different circumstances, and to challenge me by dealing with two different clients or employers, but also to work under higher pressure, as this meant additional work for me and challenged my organisational skills.

Taking my two years of experience of training in this course into account, I have definitely undergone a dramatic development as a result of the multifaceted programme curriculum– both on a professional, but also on a personal level. Professionally, I have evolved from a recent graduate with very little experience and practical skills working in the UK into a full-time working professional in a health psychology environment that encompasses the relevant aspects of the five competencies. Although I initially did not plan to pursue a career in the commercial domain, I felt increasingly comfortable in regards to my transition into a role in a fast-paced and financially driven business environment, which at times meant compromising academic quality that is common in the research domain, for work outputs that align with specific client needs and restricted time and budget-related restrictions. With the various opportunities I encountered during my time as a trainee, not only did I gain confidence in seeking out experience to enhance my professional skills and status, such as presenting at conferences or sharing my knowledge with undergraduate students, but it also provided a wide range of valuable impressions and meaningful learnings that formed my personal development and made me more open towards accepting challenging situations outside my comfort zone, especially related to networking and communicating confidently with other professionals, which was something I especially struggled with before enrolling on the course.

This journey has overall been an exciting learning experience with many positive milestones I achieved during the process, for example my first publication of my systematic review. I reflect on very positively upon these two years, and I hope to evolve further in the future through becoming and working as a chartered Health Psychologist.

Competence 3.0

Research Project

Exploring the Impact of Food-related

Thinking

Styles on Weight Gain

Content

Abstract

Obesity is a growing health epidemic with a constant rise in weight-related medical conditions, premature deaths and detrimental psychological outcomes, which places a burden on multiple aspects of health systems. From a biopsychosocial perspective, the aetiology the complex and current approaches of weight management predominantly focus on dietary modification, while underlying psychological factors, especially cognitive mechanisms, receive little attention. Particular thinking styles, including Food Thought Suppression and Preoccupation with Food have been identified in overweight and obese people, however had not been studied in regards to their involvement in weight gain. The present study aimed to identify food-related thoughts as predictors for weight gain. The sample mainly consisted of women who were recruited on social media platforms (N=139). A mixed-method design was applied, consisting of a quantitative analysis with factors including Food Thought Suppression, Preoccupation with Food, Body Mass Index, educational level, ethnicity and age. A regression analysis was performed with all variables, which informed the final predictor model. A one-way ANOVA investigated differences between weight categories. Additional food-related thinking styles and coping strategies were explored in semi-structured qualitative interviews in a subset of the quantitative sample (n=6) who have a BMI on the upper healthy weight range (23 – 24.99), or at least overweight (≥25). While regression analysis showed no significant link between body weight and Food Thought Suppression and Food Preoccupation, Afro-Caribbean ethnicity was associated with a higher weight status. A Thematic Analysis of the qualitative interviews identified three overarching themes: 1) "Why am I all about food?", 2.) Jekyll & Hyde and 3.) Emotional attachment to food. The first theme summarises a high tendency to ruminate about food choices due to the high reward response, the need for control via strict monitoring, and an underlying negative body image, which was predominantly expressed in women. The second theme describes the inner conflict between the pursuit of healthy eating and the temptation to indulge in overeating, which results

in a strong tendency to categorise food as "good" and "bad". In this context, discussed coping strategies included trigger avoidance, positive imagining of future outcomes and adopting the rational approach "food is fuel". Finally, a tendency for emotional attachment to food, including eating in response to negative emotions and positive associations with societal food rituals, which was triggered by positive nostalgic memories. Men tended to adopt are more rational approach to food than women, and their body image did not seem to be related to their food choices.

Acceptance Commitment Therapy in combination with Cognitive Behavioural Therapy has been suggested as a promising gateway to addressing maladaptive thought patterns and difficult emotions linked to disordered eating and weight gain. Considering the qualitative findings, the role of emotions needs to be emphasised as equally relevant factors in the context of food choices and eating behaviours, as they tend to be directly linked to food-related thoughts and behaviours. Furthermore, the present results and literature support a link between dieting and negative thinking, which likely foster unhealthy eating patterns. Therefore, intuitive eating may offer a useful alternative to re-establish a healthier relationship with food, particularly for women. Future research should explore the development of a diagnostic tool to help clinicians make more informed decisions for suitable intervention approaches for individuals that can address relevant underlying thoughts and emotions, but also cultural variables such as ethnicity, for improved effectiveness and personalisation of weight management programmes.

1 Introduction

1.1. Obesity as a public health problem

Over the past decade obesity has become one of society's major health challenges (Morris, Beilharz, Maniam, Reichelt, & Westbrook, 2015), and has surpassed smoking as the leading cause of preventable deaths in the US (World Health Organisation, 2015), leading to an increasing burden on the health system (Selassie & Sinha, 2011). Although not as significant, statistics show similarly concerning trends for the UK, where after smoking, obesity was found to be the second leading cause of premature death (NHS, 2016). As a consequence, many doctors and public health officials have declared it as an urgent public health crisis (Thibodeau & Flusberg, 2017).

Being overweight or obese is a predictor for a variety of serious chronic medical conditions (Bray 2004; Reilly & Kelly, 2010; Guh et al, 2009) and is associated with lower quality of life and decreased life expectancy (Peeters et al, 2003). However, despite the general appreciation of these well-established dangers, incidence rates have been steadily climbing over the last decades (Thibodeau & Flusberg, 2017): The analysis of trend data from 188 countries found that worldwide, the proportion of male adults with a Body Mass Index (BMI) of 25 or more, increased from 29% in 1980 to 37% in 2013, while the proportion of female adults with the BMI stated above, increased by 8% over the same period (Ng et al., 2014). A recent study investigating trends in mean Body Mass Indeces (BMIs) found that obese people now outnumber the undernourished worldwide (Consultancy UK, 2015). If these trends persist, by 2025 the global prevalence of obesity could reach 18% for men and exceed 21% for women, while severe obesity will surpass 6% in men and 9% in women. Nonetheless, underweight remains prevalent in the world's poorest regions, especially in South Asia, highlighting the unequal global distribution with a clear tendency for industrialised Western countries that account for the majority of increase in people within the overweight and obese categories. Nevertheless, substantial evidence has also highlighted a meaningful increase in the prevalence of

excess weight in children and adolescents in developed countries where 24% of boys and 23% of girls were recently classified as overweight or obese worldwide (Sedghi, 2014).

The United States, however, show by far more alarming numbers with prevalence rates of overweight and obesity increasing by 13% over the past three decades. This should raise particular concern because despite this continuous and dramatic rise, the percentage of this population trying to lose weight has decreased by 7% at the same time. This trend was considered statistically significant in Caucasian men and women and was even more pronounced among women of Afro-Caribbean ethnicity, with the majority (55%) developing an overweight BMI. These findings suggest that while the average BMI is continuously rising, fewer people are engaging in efforts to reduce their weight, which emphasises a growing gap that needs to be addressed urgently (Snook et al., 2017). This trend is reflected by alarming nationwide figures registering a rapid incline of high BMI rates in the last decades: While in 1962 less than half of the population (46%) fell into the overweight category, this number climbed to 75% by 2010. Although the rates have remained more stable between 1999—2010, the growing number of people with an unhealthy weight is still significant enough to raise concern (Ogden & Carroll, 2010; Flegal et al, 2012). There is growing evidence for a similarly alarming trend in the UK, although not quite as dramatic as in the United States: Findings demonstrate that approximately 67% of men and 57% of women in the UK currently are either overweight or obese, according to the categories defined by the WHO that classify an overweight BMI over 25, and an obese BMI over 30. According to a statistical analysis of international prevalence rates, the UK is the country with the third highest rate of excess weight in Western Europe behind Iceland and Malta (Sedghi, 2014). By 2030, as many as 65 million more adults in the USA, and an additional 11 million in the UK could be classified as obese (Wang, McPherson, Marsh, Gortmaker, & Brown, 2011). The importance of addressing issues contributing to obesity is clear: Currently there is no indication of this trend ceasing, while increasing evidence is illustrating a simultaneous increase in excess weight across the population (Aitken, Allman-Farinelli, King, & Bauman, 2009).

The impact of obesity is not limited to detrimental health consequences, but also has been associated with financial burden in society: Analysis have detailed $2 trillion in economic yearly loss, through both direct medical cost and indirect cost of decreased work productivity (Dobbs et al., 2014). In the UK these costs brings along a burden of $73 billion, or around 3% of the gross domestic product (GDP) (Consultancy UK, 2015). Therefore, in light of the overwhelming and coherent evidence obesity is a highly concerning issue in today's society that calls for urgent and impacting action.

1.2. Determining weight status using the Body Mass Index

The interest in a quantified measure to determine body fat came with the trend of an increasing body weight across Western societies. This led to an increasing need to define and conceptualise body weight considered above a healthy limit, with the most basic definition of overweight and obesity being excessive weight or body fat that "presents a risk to health" (WHO, 2000). The Body Mass Index (BMI) is considered a reliable and universally used assessment method for defining different weight categories according to this definition. The measure originates from Belgian astronomer Adolphe Quetelet in the 19th century (Eknoyan, 2008), and subsequently the modern term "Body Mass Index" for human body weight was introduced in 1972 (Blackburn & Jacobs, 2014).The BMI is calculated by dividing the body mass by the square of body height, and is expressed in units of kg/m^2 resulting from body weight in kilograms and height in metres. The final value is allocated into either of the defined weight categories with corresponding cut-offs (see Figure 1). Initially the BMI was deemed appropriate for population studies, rather than an individual level, however due to its simplicity clinicians began implementing the BMI as a standard tool for preliminary diagnosis (National Heart, Long and Blood Institute, 2014). In the early 1990s the World Health Organisation (WHO) adopted the BMI as a tool to determine the level of obesity quickly and effectively (Nuttall, 2015). Although there is some debate about where the cut-off values should be placed, commonly accepted ranges are under 18.5 kg/m^2 for underweight, 18.5 to 25 for normal weight, 25 to 30 for overweight and over

30 for adipositas (World Health Organisation, 2006a). The clear advantage of the BMI is its easy, cost-effective and non-invasive way of determining excess body fat. Additionally, it can equally be applied in both sexes, throughout all ages groups within adults, and it considers both the individual's age and activity level (World Health Organisation, 2016). Despite its popularity and convenience, the BMI as a measure of obesity has long led to disagreements as critics have mainly argued that it is not

Weight categories	BMI (kg/m^2)
Underweight	< 18.5
Healthy weight	18.5 – 24.9
Overweight	25 – 29.9
Obese	30 – 34.9
Severely obese	35 – 39.9
Morbidly obese	≥40

Figure 1. BMI categories

suitable for distinguishing between fat and muscle. For example, it is likely that two individuals with the same BMI score who differ in their fat distribution represent different health risks, however both would be reported as an overweight statistic. This ambiguity has led to ongoing questioning of its validity in measuring overweight status. Other confounding factors are fitness (indicated by muscle mass), ethnic origin and puberty, which may lead to significant misclassifications. Some research suggests that there may be alternative more precise measures for 'fatness' than the BMI, including waist to hip circumference, body fat ratio and skin fold thickness. However, the implementation of those assessment methods on a population-wide level are significantly more time-consuming, expensive or prone to errors. Therefore it has been concluded that despite the BMI not being a 'gold standard' measure of overweight or obesity, its convenient measurement, established cut-offs and publically available statistics make it the only currently viable option for monitoring underlying health risks resulting from excess weight (National Obesity Observatory, 2009).

1.3. Impact of obesity on physical and mental health

Excess body weight is directly associated with numerous serious health conditions, which helps in understanding the increased mortality risk: Research has shown that individuals whose BMI falls into the overweight (defined as BMI ≥25<30) or obese categories (defined as BMI ≥30) are more likely to experience health problems associated with excess weight, which may result in disease and disability. Obesity is considered a causative factor increasing an individual's risk of developing cardiovascular disease and Type II diabetes, particularly threatening health consequences (Reilly & Kelly, 2011). The reason why excess weight can cause diabetes are the elevated glucose levels over time, which trigger release of insulin. Another consequence of high body weight is the body's inability to optimally supply the heart with blood, as fatty deposits build up in the artery walls over time narrowing the arteries. Heart disease is the result of the hardening of the arteries, which can occur when fatty deposits are present in the body for an extended period. This condition is referred to as atherosclerosis and is ten times more common in obese populations than for other weight categories. The long-term effects can be life-threatening conditions including angina (chest pain) or myocardial infarctions. Furthermore, higher body weight can trigger the formation of blood clots in the arteries, increasing the risk of stroke (NHS Choices, 2016). With obesity affecting the body in different and complex ways, there is a higher likelihood of experiencing various health risks and disease comorbidities. The clinical risk of developing heart disease resulting from excessive weight is commonly referred to as metabolic syndrome, which summarises a cluster of conditions, including increased blood pressure, excess body fat around the waist, and abnormal cholesterol or triglyceride levels that occur simultaneously as a result of the additional fat deposits putting increased strain on the blood vessels (Mayo Clinic, 2017). Further possible consequences of being overweight include cancer, sleep apnoea, high blood pressure and joint problems, such as osteoarthritis (Stanford Health, 2017). Taking into account the substantial and clear evidence of negative outcomes associated with excess weight, the effect on morbidity is significant: Researchers have found that being moderately obese reduces life expectancy by an average of 3 years, while

severe obesity can take 10 years off somebody's life. This is equal to the effects of lifelong smoking (Abdullah et al, 2011). The negative effects of increased weight are not limited to obese individuals - even modest weight gain amongst people who are not overweight or obese can cause dangerous changes to the heart. The Dallas Heart Study, which was recently conducted by the UT Southwestern Medical Centre, found that weight increases as little as 5% can result in remodelling of the heart and abnormal changes in the heart muscle, which can ultimately lead to heart failure, which stems from the heart's decreased capacity to pump blood (Wilner et al, 2017). This highlights the importance of weight management not exclusively for those with a body weight that is considered unhealthy by standard definition.

Adding to the physical impact, obesity or overweight poses a risk for psychological distress. Past research has highlighted that certain psychiatric conditions are more prevalent in obese populations, including mood disorders, particularly bipolar disorder and dysthymia, as well as anxiety disorders and a number of personality disorders, including antisocial, avoidant, schizoid, paranoid, and obsessive-compulsive personality disorders (Ratcliffe & Ellison, 2015; Simon et al, 2008; Heo et al, 2006; Petry et al, 2008; Scott et al, 2008). One particular study demonstrated a delayed effect of mood disorders on weight, as adolescent depression was significantly linked to adult obesity (Richardson et al, 2003). Although these findings provide a clear evidence base for the impact of emotional factors on weight gain, the causality is still unclear in terms of whether a psychological state predicts a higher body, or whether weight gain alters somebody's mood, adding further complexity to the contribution of emotions to weight gain (Faith et al, 2011; Grundy et al, 2014). In the context of psychiatric interventions, pharmacological treatments, such as antidepressants, may additionally explain the risk for weight gain, as they can knowingly stimulate a preference for sweet and fatty foods, and decrease the resting metabolic rate due to changes in neurotransmitter activity (Grundy et al, 2014). To date the role of gender in the link between emotions and weight has not been clearly established (Atlantis & Ball, 2008). Instead, a more recent study has suggested that emotional eating may act as a mediator between depression and weight gain (Van Strien et al, 2016). Emotional

eating is defined as a psychological eating style in response to negative emotions such as depression. Although clinical depression is typically associated with loss of appetite (American Psychiatric Association, 2013), in some cases it can trigger increased appetite resulting in weight gain, therefore representing a risk of developing obesity (Levitan et al, 2012; Lasserre et al, 2014).

Moreover, malfunctioning eating patterns may be a result of eating disorders: Although obesity itself is not a criterion for binge eating disorder, researchers have established a strong positive association between weight and behavioral binge eating patterns. It is hence not surprising that over 65% of people with binge eating disorder are obese (Hudson et al., 2007). This is supported by additional findings indicating that obese binge eaters tend to have a higher body weight, a greater psychopathology, higher weight and shape concerns, more negative self-evaluations, a lower self-esteem and an impaired health related quality of life compared to obese non-binge eaters (Javaras et al., 2008; Vancampfort et al., 2014). Rather than being limited to clinically severe psychiatric conditions, research has also documented the detrimental emotional consequences associated with excess weight, which is frequently manifested as high distress from being exposed to weight stigma and discrimination by the social environment, which can trigger problematic thoughts and emotions, such as negative body image, low mood, attentional and mood shifts, and avoidance behaviours (Ratcliffe & Ellison, 2015; Atlantis & Ball, 2008). Despite increasing evidence, public health implications of weight-related discrimination are widely ignored, as a there is a common perception in society that people are ultimately responsible for their weight. Accordingly, criticising somebody's weight is considered acceptable and necessary to raise awareness by the general public, as it is believed to motivate weight loss. However, the opposite effect may be more likely, as stigmatisation can add on to people's feelings of shame and self-disgust, putting them at risk of further overeating. These negative self-beliefs and emotions are known to interfere with weight loss interventions their self-destructive and passive nature (Puhl & Heuer, 2011). Interestingly, depressive symptoms are more common among obese adults who perceive themselves to be overweight than in those who classify themselves as having

a healthy weight, suggesting that weight perception rather than weight status *per se* may cause depression. This finding supports a psychosocial, rather than a biological, interaction with emotional distress (Xie et al, 2006; Chang & Christkis, 2003; Blokstra, Burns & Seidell, 1999; Atlantis & Ball, 2008).

Regarding the role of psychological factors in the process of weight gain, researchers discuss the ambiguity in determining their causality: While some argue that baseline mental disorders, such as depression and anxiety, predict obesity (Barefoot et al, 1998; Hasler et al, 2005; Richardson et al, 2003), others suggest the opposite direction. A possible explanation for this controversy is the development of a vicious cycle between emotional triggers and overeating over time. Therefore, both factors are likely to boost one another and cannot be seen in isolation. Considering this bidirectional link, a multifactorial model, which describes psychosocial, lifestyle and physiological factors, seems plausible to explore the relevant causes of obesity (Goldney & Wittard 2009).

1.4.Causes of obesity

As the obesity epidemic is becoming a more prominent issue, it is crucial to understand underlying processes that are involved in weight gain in order to tackle the causes, both in regards to the risk of developing adiposity as well as maintaining excess weight. The biopsychosocial model offers a holistic and widely used approach for establishing and structuring causal factors by their source. Internal factors consist of physiological processes and personal factors, including demographics, emotions and beliefs. External factors, on the other hand, compromise the environment, for example the social network, societal and cultural cues. Both clusters are interdependent, therefore they cannot be seen in isolation regarding their contributive role to outcomes (Schwartz, 1982). This equally applies to obesity, as multiple causational models and perspectives have been suggested:

Contextual factors can influence people's eating behaviour with significant impact on their body weight. Generally, two main categories are considered as external cues in people's food context, including food

characteristics and the food environment. Certain characteristics of food, including macro food groups and the nutritional profile, have been related to an increased appetite and subsequent overeating. More specifically, foods with high energy density, fat content or a sweet-fat combination have been linked to weight gain in both adults and children. Moreover, an increase in portion sizes in restaurants and ready meals over the past decades has been linked to rising obesity rates (Vartanian et al, 2007). Features of the food environment that encourage harmful eating patterns, especially overeating, include abundant availability of certain foods, visual presentation and cultural norms (Blundell 2005).

Additionally, the social context has been studied in regards to their effect on people's eating behaviours. The risk of overeating tends to be higher when people eat in the company of others, whereas people generally express reluctance to eat big portions around strangers. The suggested reason is the impact of social desirability as most people have a strong interest to be seen in a positive light by others. This particularly applies to women who often believe that a smaller food intake may make them more attractive to the opposite sex. Furthermore, the impact of social interaction was studied, and researchers concluded that food consumption requires increased cognitive effort and focus, which can be diverted by social stimulation, therefore the capacity needed to engage in eating behaviours may be reduced. Mechanisms in social situations appear to have a distinct effect on food consumption compared to types of distraction. The addition of the social element to an eating scenario provides more complex information that the individual is required to process compared to watching television for example, as it requires more encoding and reacting to. As a consequence, eating in a social context can encourage disengagement with eating, and therefore promote undereating (Ogden et al, 2013).

The role of environmental factors for weight gain are particularly evident in light of the sudden rise in the obesity incidence rates between the 1970s and 1980s. Considering the simultaneous improvements for almost all other health outcomes during that time, this may initially appear paradoxical, hence researchers concluded that weight gain must have been caused as a result of environmental changes (Bleich et al, 2008). Notably, the calorie

supply in Western countries increased significantly between 1985 and 2000 (Putnam & Allshouse, 1999), which suggests that excess food intake, rather than lack of physical activity, is likely to be the main cause for the rise in obesity (Owen et al, 2010; Swinburn, Sacks & Ravussin, 2009). It is notable that technological advances have allowed mass production of foods at a lower cost which led to a wider availability of chemically laden ready meals that have increasingly replaced traditional home-cooked meals. At the same time affordable fast food restaurants became increasingly present and popular (Bleich et al, 2008), which is crucial for explaining the obesity trend as there evidence highlights clear link between the consumption of processed foods and weight gain (Barr & Wright, 2010; (Montana 2010). Additionally, the sociocultural development has likely contributed to the shift from homemade meals to convenience food, which is supported by the strong increase in female employments in the 1970s. This is believed to have restricted available time for meal preparation for the family since a substantial body of literature has shown meaningful correlations between maternal working hours and children's weight (Hawkins et al, 2008; Brown et al, 2010; De Moira, Power & Li, 2010).

However, external factors alone insufficiently explain obesity, as research has shown that some people gain weight in situations that trigger overeating very easily, while others remain lean (Blundell 2005). To better understand this discrepancy, it is necessary to explore the link between personal characteristics in people who engage in overeating and their eating patterns. Previous research (Veugelers & Fitzgerald, 2005; Quick, Wall, Larson, Haines et al, 2013) highlights an emphasis on demographic and lifestyle factors, demonstrating that a lower social class, poor education, a parental emphasis of body weight and shape, weight-control behaviours such as dieting and binge eating, a higher dietary intake and decreased physical activity, are linked to the aetiology of overweight in adolescents. A systematic review has additionally revealed the role of insufficient sleep, substance abuse (including smoking, drugs and alcohol), technology-induced pathology, sunlight underexposure and occupational factors, such as income security, as these factors show independent correlations to adiposity (Egger & Dixon, 2014).

While there is copious evidence detailing environmental theories helping to predict obesity, research undertaken around psychological risk factors is limited. Literature that studied personality traits has suggested a cluster of personality traits which are linked to a higher weight status. For example, certain people have a tendency to overeat in response to negative emotions, and they are also more likely to react passively to problems, are unable to access social support sufficiently and generally have low self-efficacy (Elfhag & Roessner, 2004). Moreover, specific traits including neuroticism, low consciousness, a low sense of order and low impulse control have been associated with obesity (Sutin et al, 2011). Other researchers have identified chronic psychological stress as a predictor for maladaptive eating behaviours that may be responsible for weight gain over time (McGrady & Moss, 2013). This phenomenon may be explained by the initial physiological response to stress. According to the comfort food hypothesis the consecutive rise in glucocorticoids, a steroid hormone, lead to an increased drive for pleasurable and impulsive activities, which explains a preference for consuming palatable foods in stressful situations as a physical protection mechanism. In addition to this, glucocorticoids facilitate visceral fat retention which eventually results in weight gain. Chronic stress can promote a reward response to food items containing high carbohydrate and high saturated fat, making further weight gain more likely (Roberts et al, 2014). The physical tendency towards unhealthier foods is further intensified if individuals engage in constant weight loss efforts that involve calories restriction and monitoring, as this triggers further cortisol production in the body, therefore making weight management particularly challenging because people have to constantly fight cravings for fattening foods in order not to exceed their energy intake that is required to reduce their body weight (Tomiyama et al, 2010).

Moreover, several researchers have recognised the impact of the emotional state on individuals' eating behaviour. According to Canetti et al. (2002), food choices around quantity and frequency of eating are not limited to a simple hunger response. While healthy weight individuals alter their food intake when satiated, people who are overweight or obese will eat regardless of their physiological state. Instead they are more responsive to

internal situational or emotional factors, such as negative mood, fatigue or boredom (Mehrabian 1980; Schlundt 2000). Paradoxically, being on a diet may further intensify the tendency to engage in overeating, which is likely to occur as dieters are generally more prone to emotional eating (Cannetti et al, 2002). In the context of emotive drivers, the role of past experiences has been discussed in the context of weight gain. Childhood traumas or impairments in the relation dynamic with mothers have been identified as significant risk factors for problematic eating patterns. This observation likely stems from the mediating role of emotion dysregulation and depressed feelings (Michopoulous et al, 2015). Unhealthy eating patterns are not limited to negative emotions but also occur after experiencing positive emotions, which suggests that a heightened emotional state as a reaction to heightened dopamine levels, rather than the meaning, triggers impulsive behaviours around food, such as binge eating (Macht 1999; Cyders & Smith, 2008).

1.4.1. The role of cognitive factors in weight gain

Cognitive processes, such as particular thinking styles and beliefs, have been identified as potential additional factors explaining weight differences: Byrne et al (2003) compared cognitive traits expressed by successful weight maintainers to those in weight regainers, and found that dissatisfaction with weight, dichotomous thinking, evaluation of weight and shape, and lack of vigilance for weight control are associated with a higher likelihood to regain weight following a diet. Furthermore, certain unhelpful beliefs are discouraging people in their weight loss efforts, leading them to abandon their diets which often triggers weight regain, especially if the costs of weight management are perceived to outweigh the benefits (Ohshiek & Williams, 2011). In this context, Dr Judith Beck has defined the concept of Self-Sabotaging Thinking, which is thought to be a common cognitive barrier to weight loss. Self-sabotaging thoughts tend to occur in the context of eating, and include 'All or nothing' thinking, mind-reading, catastrophizing and exaggeration. Over time the intensification of these thoughts result in a vicious cycle of dysfunctional cognitions that people go

through repeatedly, which triggers further additional negative, dysfunctional behaviours and emotions. Therefore, this cycle can be detrimental for people's self-efficacy and motivation to maintain weight loss, and may explain why healthy eating behaviours are neglected long term (Beck, 2012). An example is the perception that one small transgression from the diet has ruined the overall attempt to lose weight, causing the individual to overeat; this phenomenon has been studied by various researchers (Polivy et al, 1986; Byrne et al, 2003; Dalle Grave et al, 2013).

While the majority of literature explores cognitive processes and mechanisms that explain why certain individuals with an already high BMI successfully lose weight and others do not (Byrne et al, 2003; Barnes et al, 2010; Elfhag & Roessner; 2004), scarce research has been conducted that focuses on cognitive factors involved in the development of overweight as early risk factors for a clinical weight status, which highlights the scope for clarification in future research (Byrne, 2002). Firstly, researchers have described food thought suppression, alternatively referred to as cognitive restraint, as a central cognitive mechanism involved in the regulation of food intake. The link between food thought suppression and adiposity probably stems from the strong association with problematic eating-related factors leading to weight gain, such as binge eating and food cravings (Byrne et al, 2003). The concept of food-thought suppression derives from the Ironic Process Theory or the White Bear Problem, which refers to the psychological process whereby deliberate attempts to suppress certain thoughts make them more likely to surface (Wenzlaff & Wegner, 2000). This phenomenon was identified through thought suppression studies (Wenzlaff & Wegner, 2000) and has been observed in a variety of situations, including food-related scenarios (Byrne et al, 2002; Byrne et al, 2003; Barnes et al, 2010; Barnes et al, 2011). To this date studies have determined personal factors, including gender and weight-related aspects, as predictors for food thought suppression. Findings have shown that obese women are most likely to experience this thought pattern, which seems plausible considering its association with factors preventing weight maintenance, such as binge eating and food cravings, as well as eating concerns (Barnes 2010; Barnes 2011; May et al, 2010). There appears to be an interdependent

relationship between these components: Food cravings have been shown to lead to obsessive thoughts and impulsive consumption of craved foods in some people, which increases the risk of gaining weight (May et al, 2010). Furthermore, restrained eaters engaging in food thought suppression tend to consume more food and therefore are more likely to gain weight (Erskine et al, 2010). In contrast to this, a different study concluded that cognitive restraint is required as part of successful weight management despite a parallel link to overeating (Reed et al, 2013). A potential explanation is offered by Barnes & Tantleff-Dunn (2010), who have found a link between food thought suppression and various eating behaviours, including dieting, binge eating and food cravings. Therefore, cognitive restraint may occur as a result of obsessive thoughts around food, either as a consequence of calorie restriction or repeated engaging in excessive consumption. Although these findings offer a robust evidence base, they were primarily derived from observing an obese population. Therefore, exploring cognitive restraint in a more diverse weight samples has been recommended, as previous findings indicate that weight is likely to be a relevant factor in explaining differences (Barnes 2010; 2011).

Since portion control appears to be difficult for overweight people, it was suggested that although food may not be physically addictive, it can be a powerful reinforcer for excessive consumption as a result of the high dopaminergic reward following repeated intake. Researchers believe that individual factors, including taste perception, sensitivity to the food environment and the incentive value of food, can account for individual differences in the perceived salience of food (Robinson & Berridge, 1993; Drayna 2005;Beaver et al, 2006). As a result, some people process food-related information more extensively than others, and this phenomenon is referred to as food-related attentional bias. Previous research conducted in the UK, Greece and Iran has documented a significant link between the food-related attentional bias and higher levels of dietary restraint (e.g. efforts to reduce food intake), which can trigger overeating. On the other hand, food-related attentional bias has been linked to disinhibition, which can help understand why overeating occurs despite continuous efforts to reduce food intake (Tapper, Pothos, Fadardi & Ziori, 2008). Therefore, a high reactivity

to food cues combined with a tendency to attend to food-related cues likely leads to a loss of control over eating habits (Sharpe, 2008). The relationship between dietary restraint and risk of overweight and obesity has repeatedly been established (Fairburn & Harrison, 2003; Polivy & Herman, 1985; Stice 2002). The food-related attentional bias also applies to dieters and can paradoxically sabotage weight loss goals This suggests that attempts to restrict calories can actually be counterproductive for certain people, leading to weight gain or difficulties to lose weight. (Fadardi & Bazzaz, 2011). Based on these observations, researchers have defined food preoccupation as a thinking style in the context of the food-related attentional bias, as it describes the frequency, nature and intensity of food-related thoughts. High preoccupation with food is likely to contribute to the development and maintenance of overweight (Tapper & Pothos, 2010). There is robust evidence that having frequent food-related thoughts predicts a higher body weight, as people with high vulnerability for environmental food-related cues may feel more inclined to overeat (Bond, Phelan, Leahey, Hill & Wing, 2009; Mela 2011). In contrast to this finding, food preoccupation has additionally been identified as a possible weight loss mechanism, as it can help reinforce strategies how to eat healthily and how to cope with urges to overeat (Elfhag, Barkeling, Carlsson, Lindgren & Rössner, 2004). However, the effect of food preoccupation on body weight is still scarce, and it remains unclear whether being preoccupied with food is more present among obese populations or in those with a healthy weight. Food preoccupation can be both positive (e.g. excitement prior to a meal) and negative (e.g. thinking about a particular food that someone is trying to avoid). Interestingly, in the context of different BMI categories negative thoughts tend to predict a higher BMI, especially among obese adults (Glaser, 2015).

1.5. Theoretical framework

The amount of calories that people consume directly affects their body weight, and there is a growing evidence that specific psychological processes involved in food choices people make are likely to contribute to weight gain: Researchers have identified differences in the way a typical obese person

and a healthy weight person choose and react to food, suggesting that the decision process guiding food choices varies across individuals and situations. While pioneering work has suggested that specific anchors, including taste, health, social status and cost, predict particular food patterns (Lewin, 1951), later investigations recognised the role of cognitive and motivational components, which are particularly relevant for accessing a wide range of foods in Western societies as they add to autonomy in choices (Lau et al., 1984; Michela & Contento,1986; Rappoport et al., 1993). Due to the abundance of food choices underlying motivations for food-related decisions are often multifaceted and highly contextual, which makes food choice a complex and individual process (Furst et al, 1996). This has added to the understanding that food intake is an outcome of interactions between physical and sociocultural cues, but also more stable individual psychological characteristics. It is important to understand how these cues interact in decisional processes that lead to harmful dietary patterns causing overweight.

Robust evidence has established that obese individuals tend to eat greater amounts of food despite feeling full (Ferridan & Brunstorm, 2011), make unhealthy food choices more often (Mela, 2011), and are more responsive to external cues (e.g. time of the day, availability and quality of food). On the other hand, populations with a healthy weight tend to be influenced by internal cues, such as hunger to a higher extent (Sharpe, 2008). Moreover, overweight and obese individuals show a tendency towards selecting more energy-dense foods, which may contribute to their increase in weight. Difficulties to maintain a healthy weight could therefore reflect specific cues and motivations, rather than just be a result of a physiological preference. Furthermore, people with higher concerns and thought perseverance around food may be more susceptible to experiencing problematic thoughts and emotions that trigger overeating and weight gain (Mela, 2001).

The Conceptual Model of Food Choice (Furst et al, 1996) is a framework that defines thoughts and other underlying cognitive determinants of people's food choices. Its primary focus is to identify and

contextualise these processes in their relation to specific eating patterns. According to the authors, the rationale for developing the framework was to highlight processes and their differential drivers for food choices, and additionally, to provide a simple tool to elicit a better understanding of relevant processes involved in people's conscious and unconscious food choices for improved guidance around targeting these in clinical practice. The researchers have integrated and built upon the work of different disciplines that study food-related internal processes including preoccupation with food and the attentional bias hypothesis amongst other. The framework is suitable for recognising cognitive elements in their multifactorial nature and focus on person-related belief systems. It provides a holistic representation of the rich and complex origins of food-related actions, and emphasizes the interaction between person-related and external factors that shape individual food decisions. Based on these principles it is possibly appropriate to address wider contextual factors in the environment including social reference systems in coexistence to internal states. The constant interaction of these different systems enables recognition of the complexity of decisional processes that predict food choices. Based on the model food choice can be categorised as three factors: (1) life course, (2) influences and (3) personal system. These three systems all contribute to the final food choice in individuals and are elaborated in the following sections. The described decisional process is outlined in the shape of a funnel, which symbolising the ongoing filtering process of personally relevant key factors that shape individual food choices (see Figure 2, p. 30).

Life course

An individual's life course is considered the 'main ingredient' for the decisional process as it is thought to have an overarching impact on the individual's current situation. A life course is understood as the sum of all personal roles in the context of the social, cultural and physical environment that a person is embedded in based on a set of existing influences. Therefore this domain highlights the importance of upbringing and culture, which serve as a crucial reference framework to explain the formation and maintenance of particular choices. Rather than being limited to past

experiences, future anticipations or personal goals are part of this domain and can occur in the form of envisioned and desirable roles, for example the desire to reduce weight as part of an ideal self. Therefore both personal history and the aspired future self result in a personal reference system that represents the underlying basis for additional influences on food-related decisions.

Influences

This category refers to relevant factors affecting an individual's choice in the present situation. It reflects ideals, such as standards or beliefs that act as reference points for comparison and judgement of food choices. These ideas are commonly based on personally relevant cultural and symbolic meanings, such as social status or group memberships. These influences tend to be manifested as an automatic and subconscious process stemming from lifelong learning, and are typically expressed as standards of how things "should be". Furthermore, a person's lifestyle and day-to-day roles can contradict to their own ideals, which can lead to internal conflicts that complicate food choices, for example a hectic work schedule that interferes with preferred meal times. Moreover, personal factors including individual taste preferences, emotions, hormones, cravings, weight, height and gender, can dictate someone's eating patterns. For instance, a person with an impulsive personality may express a spontaneous and experimental eating style.

Available resources to the individual can additionally impact on eating habits. Tangible factors, such as money, equipment and space, can play a role, but also more latent variables, for example required knowledge and skills to prepare particular meals. In addition, people's social framework shapes their food choices, which is commonly expressed in interpersonal power issues. An example could be accommodating one's own preferences and needs in favour of relevant others who are involved in the planning and preparation of meals. More generally, the societal food context can alter individual food choice as the environment often provides specific cues that encourage certain eating behaviours, for example seasonal influences affect the local availability of foods.

Personal system

Repeated food choices result in an automated cognitive pattern over time, as personal values emerge based on previous deliberations. Certain values seem to be particularly relevant for reflecting about food choices; these include perceptive properties of food (e.g. taste, nutritional value and quality), monetary considerations, convenience and social relationships. It is assumed that each person applies their propriety set of rules when weighing different values guiding their decision, depending on the present situation. These decisional processes are often well-established and occur automatically, so that the person is unaware of using them.
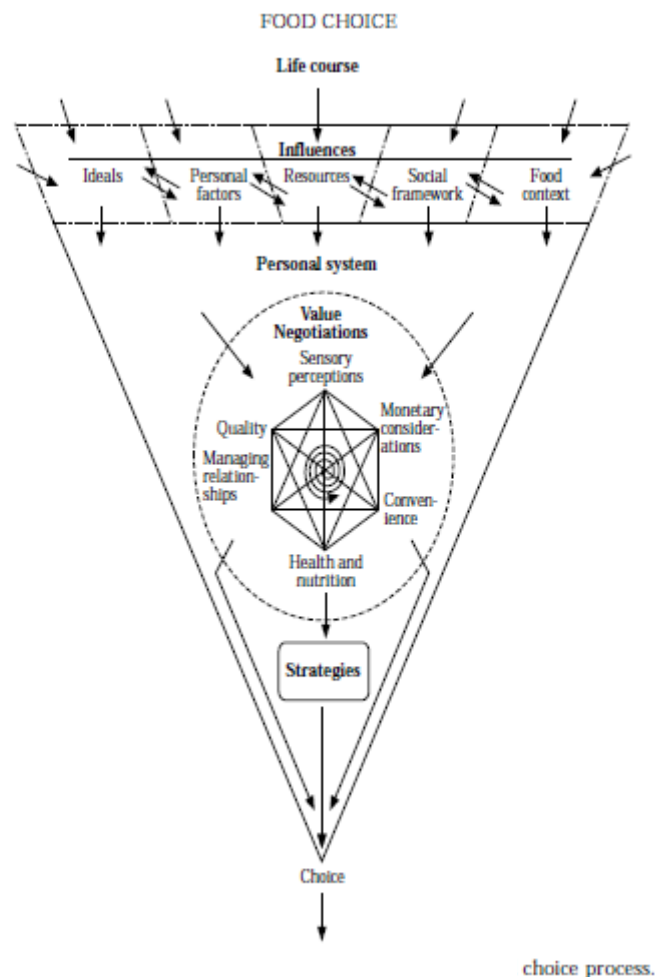

Figure 2. Conceptual model of food choice. Reprinted from "Food choice: a conceptual model of the process," by T. Furst, M. Connors, C.A. Bisogni, J. Sobal, & L.W. Falk, 1996, *Appetite*, *26*(3), p. 251. Copyright 1996 by Academic Press Ltd.

Regarding its holistic nature with a focus on internal processes, the Conceptual Model of Food Choice provides an effective and simplified tool to help organise and understand the underlying cognitive mechanisms involved in food choice processes, as it is able to recognise the role of the environment with its embedded social and cultural meaning. On the other hand, internal, and potentially subconscious effects, such as life-long learning are taken into account (Furst et al, 1996). Since its development the model has been used in different contexts to explore people's motivation for certain eating behaviours, for example the role of life course experiences and events (Bisogni et al, 2005), binge eating, food scripts and food rituals (Bisogni et al, 2008), food refusal in terminal illness (Hughes & Neil, 2000), as well as to identify changes in societal food choices and future developments (Massa, Karisto & Lillunen, 2011). However, to date it has not been studied in the context of weight-related changes.. The rationale for drawing onto this model for the present study lies in its ability to incorporate food-related thoughts which clearly are, although not explicitly mentioned, part of the described value and belief systems, and act as relevant mechanisms in the filtering process. The final decisional outcome of the choice process may therefore serve as a relevant explanation for certain beliefs, thinking patterns and emotions that are characteristic of people with a higher, or a lower, body weight. For example, by using the model it may be possible to identify relevant heuristics for engaging in healthy or unhealthy eating behaviours.

1.6. Study aims & hypotheses

Commonly prescribed weight loss interventions and preventive measures to address weight gain only show limited effectiveness in regards to curbing the concerningly increasing obesity rates. This suggests that simply prescribing weight loss diets is simply not sufficient, but experts and clinicians also need to tackle the psychological processes that encourage behaviours associated with weight gain. Indeed, experts are increasingly raising the need to address the cognitive aspects of obesity (e.g., Byrne, 2002; Cooper & Fairburn, 2001). Emerging evidence has highlighted the

need to explore weight-related differences in food-related cognitive processes, as individuals at a healthy weight may engage in a different thinking style to those who already are overweight or obese (Barnes et al, 2010).

Although a growing number of interventions are now incorporating elements to address food-related thoughts and underlying motivations (e.g., Cooper & Fairburn, 2001; Rapoport, Clark & Wardle, 2000), previous efforts still fall far short of addressing cognitive components, especially in the context of weight gain. While existing studies have explored cognitive patterns in obese individuals (Barnes et al, 2010; Barnes et al, 2011; Byrne et al, 2002; Byrne et al, 2003), scarce research has compared thought processes for different weight categories in terms of their nature and intensity. Therefore, in order to fully implement effective weight management, a deeper appreciation of the influence of cognitive factors contributing to weight management concerns is needed, including populations from the entire BMI range which can help identifying relevant predictors for increased body weight. Interestingly, currently available research exists for obese populations, people who have lost weight or people that have regained weight, however previous studies have rarely included people with a healthy weight in their samples. The only study that observed healthy weight individuals (Byrne et al, 2003), covered the entire healthy weight range.

Based on this limitation it was recommended to explore food-related thoughts in people who are still at a healthy BMI, but display an increased risk of transitioning into the overweight category. This could add valuable understanding by determining why people gain weight to an unhealthy extent in the first place. and to what extent initial beliefs and thoughts around eating may differ to thinking styles that occur post weight gain. If the present study finds noticeable differences between people at risk of weight gain and those already at an unhealthy body weight, this could mean that certain thinking styles present a risk for weight gain, however may change once a person reaches a higher BMI where different mechanisms more likely account for the maintenance of an unhealthy body weight.

Based on these considerations and previous research findings, the present study will aim to clarify the following main hypotheses:

1.) H0: Food thought suppression is not correlated with BMI or predicts a low BMI.
   H1: Food thought suppression predicts a high BMI.

2.) H0: Preoccupation with food is not correlated with BMI or predicts a lower BMI.
   H1: High preoccupation with food predict a high BMI.

3.) H0: People at risk of overweight (BMI= 23- 24.99) do not differ significantly from overweight individuals (BMI ≥25) in the extent of suppressing food-related thoughts.
   H1: People at risk of overweight (BMI= 23- 24.99) differ significantly from overweight individuals (BMI ≥25) in the extent of suppressing food-related thoughts.

4.) H0: People at risk of overweight (BMI= 23- 24.99) do not differ significantly from overweight individuals (BMI ≥25) in the extent of their preoccupation with food.
   H1: People at risk of overweight (BMI= 23- 24.99) differ significantly from overweight individuals (BMI ≥25) in the extent of their preoccupation with food.

The Conceptual Model of Food Choice will be used as a framework to structure the findings into different categories by considering cognitive components in the wider context of the food environment and personal factors. Moreover, the research will explore coping strategies people are using to dealing with challenging food-related thoughts, as this may inform effective cognitive techniques for supporting the uptake of healthier eating habits.

There is currently still little knowledge about the role of possible moderator variables in regards to food-related thinking styles in the context

of eating. Merely two studies have found an indirect link between food thought suppression, gender and excess weight, demonstrating that obese women may be at a higher risk of expressing cognitive patterns that were associated with behaviours triggering weight gain, such as binge eating or lack of portion control (Barnes 2010; Barnes 2011).Hence the present study will also assess in what way demographic factors influence food-related thoughts and how they may be associated with weight. Overall, this study may offer useful insights to inform novel approaches for managing obesity and to contribute to the theoretical underpinning and rationale for interventions specifically targeted towards the initial stages of weight gain. This could help delay and reduce morbidity, weight-related chronic illness and the related burden on the health system and economy significantly (Hutchesson et al, 2015). Highlighting an existing impact of underlying thinking styles on people's weight status can additionally help raise public awareness, and subsequently lead to increasing appeal to shift the predominant focus calorie restriction to a greater appreciation of cognitive causes of becoming and remaining overweight.

2   Method

2.1.Design

Considering the lack of previous recognition and investigation of food-related thinking styles in the context of body weight, particularly in healthy weight individuals who are at risk of overweight, a complimentary use of quantitative and qualitative research methods was deemed appropriate to conduct the present study. To date only few food thought constructs have been operationalised, for example food thought suppression and preoccupation with food. However, other important food-related thinking styles, such as dichotomous thinking, currently do not exist as validated measurement instruments, as they have not been explored sufficiently. This could contribute to novel insights indicating the existence of additional cognitive characteristics that may inform future research. Therefore, using quantitative and qualitative research methods in tandem may help identify novel insights about understudied cognitive patterns around food, which additionally warrants strength in reliability and validity of the design. Based

on these considerations, the present study adopted a mixed method design comparing participants of different BMI groups with focus on their food-related thoughts.

The quantitative analysis procedure consisted of a correlational analysis, which was conducted via calculating a multiple regression model to elicit predictors of higher body weight. BMI was defined as the dependent variable and was measured as a continuous numerical value. Independent variables included all hypothesised predictors for weight gain, including food-related thought constructs measured by standardised questionnaires (including frequency of thoughts, positive emotional valence, negative emotional valence, neutral emotional valence and thought suppression) and various demographic variables, including age, gender, ethnic origin and educational level. The main reason for collecting additional demographic factors was to identify potential confounders that may affect the link between weight and food-related thoughts.

Additionally, a one-way analysis of variance (ANOVA) was run to determine how food-related thoughts differ across the weight spectrum by comparing participants at risk of overweight and individuals from any overweight category. While the included food-related thought constructs were assessed via two relevant questionnaires (incl. food preoccupation and food thought suppression) served as independent variables, the dependent variable was represented by a dichotomous weight category, with a BMI of 25 marking the cut off to distinguish between both weight groups: Participants at an upper healthy range (BMI= 23 – 24.99) were allocated to the first group, whereas anyone in the sample with a classified BMI of 25 and higher was assigned to the second group.

2.2. Participants

Calculations were made to identify the appropriate sample size to ensure minimal errors in the analysis. For the ANOVA, G*power 3.1. was determined by performing an A-priori analysis to determine the mean between required sample means. Statistical power is defined as the probability of avoiding a Type II error (rejection of the research hypothesis even though it is true), and is symbolised by β. The power of a test is defined

as $1 - \beta$. It is recommended that a reasonable level of power to aim for under normal circumstances is 0.8 (Cohen, 1992). The test concluded that for each group, at least n=17 are required, which was calculated using an Alpha level of 0.05 for an independent ANOVA. Thus, the probability of making a Type II error (β) is $1 - 0.8 = 0.2$.

With one of the main objectives of the present study being a between-group comparison regarding different body weight, the participants were split up into two groups based on their BMI status. At present there is no evidence indicating a particular association between demographic characteristics and food-related thinking styles for the BMI range of 23 – 24.99, therefore no specific matching regarding gender, educational level, age and ethnicity was needed. The first group consisted of adult participants with a weight defined at least as overweight (BMI ≥25), while people who are by definition of the BMI in the upper healthy range, a subcategory suggested by the WHO (BMI 23 to 24.99) (WHO, 2015), were assigned to the second group. In regards to A-priori assumptions for the multiple regression, it was expected that women will be overrepresented in the study compared to men, as literature has documented their generally higher tendency to engage with topics related to food and nutrition due to their higher preoccupation with food (Barnes 2011; Tapper & Pothos, 2010). This tendency meant that significantly higher female response rates to the recruitment advert can be likely. If this was the case, gender would be excluded as a variable in the regression model after ensuring that it does not account for any significant differences between groups. General guidance on determining sample size (Hair et al, 2010; Schreiber et al, 2006), suggests using a 10:1 ratio (resulting in 10 participants per variable). A pirori power calculation using G power with an alpha level of 0.05, an effect size of Cohen's d of 0.15, and a power of 0.80 revealed that a combined sample size of at least 135 would be large enough to detect effects for a total of 15 predictors. For a one-way ANOVA a minimum sample of 17 participants per group was suggested.

A subsample from both groups (N=6; n=3 from the upper healthy range, n=3 overweight or obese) were additionally recruited for qualitative follow-up interviews. Small subsets between N=6 and N=10 are generally

sufficient for Thematic Analysis (Braun & Clarke, 2013) in order to identify relevant themes for smaller scoped projects. Moreover, a small-scaled sample size appears appropriate from an ethical point of view due to the sensitive nature of the study topic, which can cause distress for those who have difficult thoughts or a negative relationship with food. Going above the minimum of required participants may therefore be problematic to justify, and having a complimentary quantitative design should provide sufficient viability in light of previously identified thinking styles..

The exclusion of children and adolescents under the age of 18 years had various reasons. Firstly, with regards to ethical considerations, it is challenging to obtain and control parental consent in the context of an online survey. Furthermore, the available literature documents a general lack of preventive measures to treat obesity with particular focus on adults, as the wide majority of existing nationwide campaigns and interventions are tailored to children and teenagers. Therefore, the contribution of slow weight gain to the increasing obesity rates during adulthood is currently not recognised sufficiently, and research should focus on better understanding underlying processes that play in role in weight gain in the adult population (Brauer et al, 2015).

2.3. Materials

The quantitative survey was provided through an online link presenting several questionnaires in consecutive steps (see Appendix 3), which have been previously used and validated in obese and healthy weight populations.

Food Thought Suppression Inventory (FSTI, Appendix 3, p. 123)

Previous research suggests that efforts to suppress any occurring thoughts in relation to eating can actually have the opposite effect, and, rather than reducing them, can increase rumination about food. Consequently, phenomena that have been linked to weight gain are more likely to occur, including binge eating, food cravings, and other eating-disordered symptoms. The FSTI (Barnes, Fisak & Tantleff-Dunn, 2010) was developed to measure this thought construct. This inventory is based on

the Thought Suppression Inventory, a generic tool for assessing thought suppression (Wegner & Zanakos, 1994) and was designed as a domain-specific measure of food-related thought suppression. Psychometric tests deemed the FSTI a valid, reliable, single factor measure of food thought suppression (Barnes et al, 2010). The questionnaire consists of 15 items measuring the same general scale. Therefore, the final score, which is calculated by adding the individual values of each item, indicates the extent to which an individual suppresses thoughts around food. Individual items include self-referred statements that are rated by participants, such as "There are foods that I try not to think about" on a Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate higher levels of food thought suppression (Barnes et al, 2011). The inventory has been previously used in obese and overweight individuals (Byrne, Cooper & Fairburn, 2003; Byrne 2002, Barnes et al, 2010; Barnes et al, 2011).

For the present study it is expected that the food thought suppression score will be positively linked with a higher body weight. This hypothesis mirrors current literature, which identified meaningful relationships between food thought suppression and traits linked to overweight, including binge eating and food cravings (Barnes & Tantleff-Dunn, 2010). Because of non-existent preliminary insights for people with a healthy body weight, a non-directional hypothesis was adopted.

Food Preoccupation Questionnaire (FPQ, Appendix 3, p. 121)

Preoccupation with food, especially expressed by frequent distractive and negative thoughts, can be unhealthy and inhibit other important cognitive executive functions, such as memory or attention. Moreover, it increases the likelihood of unhealthy dietary behaviours resulting in weight gain, such as excess consumption of calories (MMISD, 2017). The Food Preoccupation Questionnaire (FPQ) is a relatively new 26 item Likert-type questionnaire, which was designed to assess the frequency of thoughts about food, and whether these thoughts are characterised with positive, negative or neutral valence. It consists of four scales, including frequency of thoughts about food (3 items), positive emotional valence of food (9 items), negative emotional valence of food (9 items) and neutral emotional valence of food (5

items). Participants are presented with a total of 26 statements they are asked rate on a 5-point scale ('completely disagree', 'disagree a bit', 'neither agree or disagree', 'agree a bit' and 'completely agree'). A unique aspect about the FPQ in comparison to similar assessment methods of this thinking style is the coverage of a broader spectrum of thinking styles, especially through the novel component "positive emotional valence", which previously only gained limited recognition. The author recommended the addition of this dimension to acknowledge the high reward value that food can represent for many people. This phenomenon originates from associative positive learning, where eating itself can be experienced as a highly pleasurable act that can trigger increased anticipation and excitement prior to the meal consumption. If this is accompanied by a lack of concern about moderating food intake, general positive valence of food likely to contribute to weight gain. The validation of the FPQ resulted in satisfactory construct validity, internal reliability, and test-retest reliability (Tapper & Pothos, 2010). To date, the questionnaire has been applied in the context of binge eating behaviours in obese samples, however no research with people in different weight categories has been published to date (Mason & Lewis, 2015). This means that for the present study no preliminary relationships in regards to different weight categories were assumed, resulting in a non-directional hypothesis.

Demographic questionnaire (Appendix 3, p. 124)

In addition to measuring food-related thinking styles, several demographic traits were assessed, as these may add potential person-related factors that affect people's thoughts. The present questionnaire measured people's gender (assessed in a dichotomous question format), age (calculated from participants' date of birth), ethnic origin (options were indicated as White, mixed/multiple ethnic groups, Asian/Asian British, Black/African, Caribbean/ Black British, other ethnic group), and educational level (selection from the following options that represent participants' education status most accurately: Higher education & professional /vocational equivalents; Alevels, vocational level 3 and equivalents; GCSE/O Level

grade A*-C, vocational level and equivalents; Qualifications at level 1 and below, or No qualifications).

As satisfactory correlations between self-reported weight with the actual measured weight have been demonstrated in the past (Davis & Gergen, 1994; McGuire, Wing & Hill, 1999; Stunkard & Albaum, 1981), it was sufficient to elicit participants' self-reported weight and height, as only a low chance for significant deviation was expected. The official formula for calculating the BMI along with the valid guidelines (Chapter 1.2, p. 14) was used to categorize the calculated score as the corresponding BMI group (underweight, healthy weight, overweight and obese) (NHS, 2013).

Self-designed qualitative interview

The qualitative piece of the study consisted of a self-designed, semi-structured interview schedule, which was specifically designed and tailored to the present study aims in regards to exploring food-related cognitive patterns and dysfunctional thoughts (Beck, 2012). This style of interview asks specific questions in an open ended way with optional suggested prompts and exploratory follow-ups. Therefore it encourages a flexible discussion on relevant topics and gives a richer insight into the *why* behind responses (e.g. why, what would change that, how has this impacted your thoughts about…). In addition, it was informed by questions eliciting coping strategies that people utilise with the purpose of reducing challenges they experience around food. Semi-structured interviews were deemed the appropriate method, as it allowed a flexible and idiographic approach by adjusting the flow of the discussion to individual differences, which was useful to encourage more vivid and personal descriptions. In addition to the insights from the quantitative survey, the qualitative study design complimented the numerical values with more in-depth insights. Especially in regards to revealing novel insights for identifying potential weight differences, which has received little attention in the past, more detailed information were required. This may support the development of novel hypotheses for future research with the aim of increasing quantification and operationalisation to warrant for higher internal validity.

Other materials

Other materials used are listed below, and are included in the Appendix.

● Consent form that the participants were asked to sign electronically by ticking a box prior to completing the quantitative questionnaires as part of the online survey (Appendix 2, p. 111).

● Consent form that the participants were asked to complete prior to taking part in the telephone interview (Appendix 4, p. 119).

● Information sheet for the participants of the online survey, providing them with full details of the study (Appendix 1, p. 117)

● Information sheet for the participants for the telephone interview, providing them with full details of the study (Appendix 4, p. 126)

● Study debrief information for all participants (Appendix 2, p. 125)

2.4.Procedure

Ethical approval was sought and granted from London Metropolitan University, School of Psychology, Research Ethics Committee, in March 2016 prior to the recruitment phase of the study. Participants were primarily recruited via public online invitations on social media networks and forums, which predominantly were obesity support groups for a targeted access to this particular weight group, as it presents a population that is typically harder to reach in random populations. In order to gain access to these online communities, the researcher approached administrative staff who manage webpage areas and support groups and requested permission to post an advertisement on their page if necessary. The remaining BMI categories were recruited across a wide range of social networks with more general content to avoid a strong emphasis on food and weight loss, which may otherwise cause a bias regarding an added focus of participants' food-related thoughts. The open invites with a brief description of the study were posted, along with a link directing the participants to the Surveymonkey website. Due to the open and widespread access that social media servers offer, this

type of recruitment was sufficient to target a representative sample of the adult UK population. The study link directed participants to a Survey Monkey (an online service which hosted the survey) questionnaire that formulated the study, including the FPQ, the FTSQ and the self-designed demographic questionnaire. The variables measured included food thought suppression, food preoccupation, age, weight, height, gender, educational level and ethnicity group. Consent to take part in the survey was sought in included consent forms along with a briefing sheet on the start page of the survey detailing the purpose of the study and how the collected data would be used, which would not allow the participant to proceed without ticking a box that they would agree to take part under the stated conditions. The consent and briefing form is included in Appendices 1 & 2 (p. 117; p. 127). Upon completion of the survey, participants were thanked for participating, and debriefed with further information relating to the. In the consent section all participants over 18 years were presented with an option to provide their contact email address if they agreed with being contacted by the researcher to take part in a follow-up telephone interview. This procedure resulted in the subsample for the qualitative interviews. Prior to the interview date the participants were sent an information sheet detailing the interview procedure and the purpose of the study was roughly elaborated. Additionally, they were asked to read and sign a consent form prior to the interview date. With obtained permission from participants prior to the interview, all conversations were audio-recorded for accuracy of transcription and analysis. Each interview lasted between 45 and 60 minutes. Confidentiality was ensured by not mentioning participant names whilst the audio-recorder was operating. Transcribed data were also de-identified with subject identifiers assigned to each participant.

In order to comply with the ethics and anonymity guidelines for study participants, it was ensured that the data, including completed questionnaires and forms, and audio tapes with additional written notes of the interviews, were kept securely locked away that can only be accessed by the researcher. Audio files and other documents containing personal information about the participants fall under the Data Protection Act, meaning they will be protected by a password and will not be distributed on any shared networks.

To ensure this, any data used for the content of the thesis were anonymised and were only permitted access by the researcher; the same applied for the archiving data. Additionally, the participant's name did not appear on any of the material, including questionnaires, audio-taped interviews and transcripts. The files were archived by assigning each participant to their own ID number before entering their data online that was used continuously to refer to individual statements, quotes or responses. Since the completion of the study, the data is being kept securely for 10 years along with back-up records (London Metropolitan University, 2017), and will then be deleted, including all hard copies and computer files that include personal information that could be allocated to an individual participant.

2.5. Data analysis

Multiple regression model with obesity predictors

In order to examine the relationship between food-related thoughts, demographic characteristics and obesity, linear multiple regression using Pearson's correlation was determined as the appropriate statistical test for the present dataset. As the central interest of the study BMI was defined as the dependent variable in the first model. As a next step, in order to generate a more general understanding of the individual relationship between factors, various correlating models with all possible combinations of independent and dependent variables were calculated, which resulted in an overarching, comprehensive model with the aim of highlighting all relevant relationships. The analysis process is described in more detail below.

I.   Numerical variables were entered into the respective models, including BMI, age, food thought suppression and preoccupation with food (consisting of thought frequency, positive valence, negative valence and neutral valence). Ethnicity, gender and educational level were coded as dummy variables.

II.   In a first step gender was entered into the regression model, however this variable was removed in the final analysis due to underrepresentation of male participants (n=6 out of a total of

N=139) after confirming that it did not account for any variance across the results.

III. Preliminary analyses were conducted to ensure no violation of the assumption of normality was given. This was tested by using the Kolmogonov-Smirnov Test, outliers and residual plots. For some outcome variables, including BMI, the data indicated a rejection of the null hypothesis, which would suggest using logistic regression. However, guidance on violated assumptions conclude that the t-test and linear regression often provide a convenient and practical alternative to recommended alternatives in sufficiently large sample sizes (Lumley et al, 2002). The fact that many of the variables were linear and non-categorical was an additional consideration for proceeding with linear regression.

IV. Further analysis were run to verify that the additional four assumptions, including linearity, homoscedasticity, multicollinearity, and absence of auto-correlations, were fulfilled. The corresponding tests showed non-significant results, which suggested that all other four assumptions were likely to be met.

V. A two-step hierarchical method was used to generate the logistic model, and variables were allocated to two blocks guided by existing literature, which suggests a strong positive link between food thought suppression and obesity (Tantless-Dunn, 2010; Soetens & Brat, 2006). Moreover, there is substantial evidence indicating that several demographic variables, including age, education and ethnicity, contribute to weight differences, however the definite direction is still unclear (Young, 2012). Although according to the FPQ food preoccupation has previously been linked to obesity, no published literature has taken different BMI groups into account. This resulted in the following blocks for BMI as the outcome variable:

Block 1: Food-thought suppression

Block 2: Age, Educational level, ethnicity & preoccupation with food

One-way ANOVA for weight group comparisons in thinking styles

A one-way ANOVA was run to test differences in food-related thought constructs between different weight groups. Prior to the testing the dataset was reviewed to ensure that the necessary assumptions for one way ANOVAs were met. For the normality criteria the Shapiro Wilk test produced slightly significant results for the majority of the analysis outputs, however since these were only slightly below the cut-off of $p= 0.05$ (0.01-0.02), and the Shapiro Wilk test is regarded as a highly conservative measure, box plots and Normal Q-Q plots were examined additionally. The data trends suggested that linearity was still likely to be sufficient. For all other assumptions, the tests produced non-significant outcomes, which indicated that violation was unlikely.

The main interest was a comparison between participants who were at risk of overweight (BMI 23 - 24.99), and the second group with those in the overweight or obese category (BMI $\geq$ 25). Consequently, additional comparisons were run between all remaining weight groups, including underweight and the lower healthy weight range to examine all possible, and potentially also relevant, group differences. Multiple analysis were run to assess any existing differences for all scales included in the questionnaires FTSI and FPQ.

Thematic Analysis

Thematic Analysis (Braun & Clarke, 2006) is a widely-used qualitative analytic method to organise rich data sets. In the present study it guided the identification, analysing and reporting of thematic patterns. Thematic Analysis is characterised by its flexibility of not using rigid guidelines that define the process, which is considered as one of its main advantages compared to other methods. Based on the assumptions of Thematic Analysis the formation of themes in the present dataset was driven by the analytical question of identifying food-related thinking styles and coping mechanisms. Therefore a theme was not necessarily dependent on quantifiable data measures, but whether it captured meaningful content in relation to the research question, which appeared a more appropriate method for the small sample size (N=6). In the first analysis step the transcripts were reviewed for

patterns of meaning in relation to the research topic to become familiar with the nature of the data. Initial codes with data features of interest for the present research were produced by systematically identifying interesting aspects in the data using example quotes to inform repeated patterns. These served as a basis for the themes after sorting and combining the codes carefully regarding their meaning for the research topics, while also considering their relationship between different levels of themes (e.g. overarching themes and sub-themes within them). After refining and integrating the themes into a meaningful and coherent pattern, they were named according to the essence that best captured the expressed content, and each theme was summarised for the purpose of reporting the outcomes in regards to the present research. The themes and assigned categories were then reviewed by an academic supervisor (EM) to validate the themes, thus adding to the overall credibility of findings and interpretations.

3 Results

3.1. Descriptive overview of variables

All sample characteristics for all the observed variables can be found in Table 1 (p. 48 f). The variables are divided by BMI group considering the main focus of the present study was to identify differences between weight groups from the sample. An initial review of the data revealed that a total of 31 respondents provided incomplete or missing data; those were subsequently excluded from the study. From a total of N=139 study participants who were included in the final sample, the most common BMI category was the lower spectrum of a healthy BMI (18.5 – 22.9) with more than a third (38%), whereas the upper healthy range (n=34) and the overweight category (n=36) had a similar number of respondents. In comparison, being underweight was the least common weight group (12%). These data indicate that the typical weight spectrum in the present sample is significantly lower than the average weight distribution in the UK population, where people in the overweight and obese category amount for 61.7% (NHS, 2015). The mean age for all participants is 26.87 years (SD 10.2) and, as expected, the overall sample is nearly exclusively female (96.7%).

In regards to the observed food-related thinking scales, the scoring represents the mean total scores; the higher the scoring, the higher the level of the respective thinking style. The table shows that the average score for food thought suppression is 45.96 (out of 75), with scores varying from 39.56 in the overweight group to 49.44 in the underweight group, which suggests that thought suppression decreases with increasing weight. In regards to food preoccupation, it can be observed that for the subscale food thought frequency, participants had an average of 3.96, which ranged from 3.55 for overweight respondents to 4.44 for underweight respondents, indicating a negative linear trend. Positive thought valence was manifested with an average score of 3.26, ranging from 3.15 to 3.42 across all weight categories. Negative valence of food was overall slightly lower with a mean of 3.26, ranging between 2.57 for underweight BMIs and 3.44 for overweight BMIs, indicating that the lower the BMI group, the higher the negative valence tends to be. On the other hand, the outcomes for neutral valence highlight a positive trend, as average scores across BMI categories show higher average scores for higher weight categories (2.25 (SD 0.72) in the underweight group; 2.75 (SD 0.96) in the overweight group). In terms of the additionally captured demographic variables, the data for the education variable reveal that the majority in the study sample reported having undergone higher education (64.38%). In comparison, respondents with lower educational levels are significantly less frequent, with Alevel, vocational level 3 and equivalents accounting for 17.1%, people with a GSCE or equivalent degree adding up to 9.6%, and participants with qualifications at level 1 and below adding up to merely 9.2% of total respondents. The upper healthy weight range group (BMI 23 – 24.99) shows a particularly strong representation of participants coming from a higher educational background (87.2%), which in relation is twice as prevalent as in underweight participants (44%). In terms of the observed ethnicity in the present sample, white respondents are represented as the most common ethnicity in the current data set (62.5%) with a particularly high relative number in the underweight weight category (76.5%), followed by Asian British (10.8%).

Table 1. Participant characteristics.

Characteristics	BMI <18.5		BMI 18.5 - 22.9		BMI 23 – 24.99		BMI ≥25		Total sample	
N	16 (12%)		53 (38%)		34 (24%)		36 (26%)		139	
	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)
Age	24.81	(12.28)	24.75	(7.04)	28.59	(11.87)	29.28	(1.37)	26.87	(10.2)
									N	%
Gender										
Male									6	(4.3)
Female									133	(96.7)
	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)
Food thought suppression score	49.44	(20.78)	48.32	(19.86)	46.52	(18.99)	39.56	(18.55)	45.96	(36.74)
Food preoccupation scores										
Thought frequency	4.44	(0.69)	4.14	(1.0)	3.7	(1.13)	3.55	(1.02)	3.96	(0.96)
Positive valence	3.18	(0.88)	3.15	(0.82)	3.3	(0.84)	3.42	(1.09)	3.26	(0.91)
Negative valence	3.44	(1.23)	3.29	(1.17)	2.87	(1.09)	2.57	(1.04)	3.04	(1.13)
Neutral valence	2.25	(0.72)	2.54	(0.92)	2.62	(0.87)	2.75	(0.96)	2.54	(0.79)

Characteristics N (%)	BMI <18.5		BMI 18.5 - 22.9		BMI 23 – 24.99		BMI ≥25		Total sample	
Education level										
No qualifications	1	(6.3)	4	(7.2)	3	(7.7)	1	(2.78)	9	(6.5)
Qualifications at level 1 and below	1	(6.3)	2	(3.6)	0	(0)	1	(2.78)	4	(2.7)
GCSE/O Level grade A*-C, vocational level and equivalents	2	(12.5)	7	(11)	2	(5.1)	3	(8.33)	14	(9.6)
Alevel, vocational level 3 and equivalents	5	(31)	7	(11)	8	(20.5)	5	(13.9)	25	(17.1)
Higher education	7	(44)	35	(63.6)	26	(87.2)	26	(72.2)	94	(64.38)
Ethnicity										
White	9	(11)	14	(16)	25	(31)	32	(40)	80	(57.5)
Mixed/ Multiple ethnic groups	6	(50)	2	(17)	4	(33)	0	(0)	12	(7.55)
Asian/ Asian British	2	(40)	0	(0)	3	(60)	0	(0)	5	(3.14)
Black/African Caribbean/ Black British	0	(0)	1	(100)	0	(0)	0	(0)	1	(0.63)
Other ethnic group	1	(33)	0	(0)	2	(67)	0	(0)	3	(1.89)

A total of 7 participants (5%) indicated that they did not classify as any of the suggested ethnic group. This constitution is similar to the most recent official prevalence rates of ethnicities in the UK, although the general population features a higher percentage of the white ethnicity subgroup (87%) than the current sample does, while members of the Asian and the Afro-Caribbean ethnicity group are slightly overrepresented in the present data sest (10.8% vs. 6.9% for Asians, and 7.2% vs. 3% for Afro-Caribbean; Census, 2011). Taking the weight range into consideration, it is noticeable that no respondents of Black origin can be found in the underweight category, and no participants with a reported mixed ethnicity are included in the upper healthy weight range.

3.2. Regression model formation

Correlations between the existing variables were assessed by performing multiple regression analysis with the main focus on obesity as the outcome variable. Subsequently, each variable was entered as a dependent variable in multiple analysis steps to better understand the individual relationship between all factors to obtain a maximum of information for the final model. In regards to reporting the outcomes, the emphasis was on describing factors explaining obesity and food-related thoughts, as this was the focus of this study. In a preliminary analysis, gender was removed from the model due to the strong underrepresentation of men in the present sample after confirming that it did not account for any group differences. Correlations were classified as high when the coefficient r was ≥0.5, a moderate relationship was assumed with r between 0.3 and 0.5, and coefficients with a magnitude between 0.1 and 0.3 indicate a low correlation (Andrews University, 2005).

Factors predicting a higher BMI

Hierarchical multiple regression was carried out to investigate the degree to which food-related thoughts, including food-thought suppression and preoccupation with food, age, educational status and ethnicity predicted a higher body weight within the sample. The detailed results for each predictor variables are included in Table 2. The first emerging model of the regression analysis revealed that food thought suppression accounted for 3.8% variance in obesity,

which was statistically significant (Adjusted $R^2 = .038$; F (6.42) = 674.18, p < 05). When the remaining 12 predictor variables (including, age, ethnicities and educational levels) were added to the model in a second step, this did not result in a statistically improved predictability as the added numerous added predictors only accounted for 11% BMI differences (adjusted $R^2 = 0.11$, F (1.889) = 1.730, p = .063). Having an Afro-Caribbean ethnicity (B= 9.71; p= 002, see Table 2), was the only significant predictor for a higher BMI.

The calculation of Pearson's correlations (see Table 4) was used to identify correlations for indicating to what extent BMI is associated with individual variables, although this would not indicate their predictability. Weak correlations were identified between BMI and higher education (r=.146) as well as for positive food-related thoughts (r= .143). On the other hand, age (r= -.143), high scores for food thought suppression (r= -.212), negative food-related thoughts (r= -.223), food thought frequency (r= -.25), as well as having Caucasian (r= -.19) or mixed ethnicity (r= -.117) were inversely related to BMI.

Factors predicting Food Thought Suppression

Considering the previous literature findings detailed in Section 2.1., the first model defined BMI as the predictor variable for food thought suppression, and the remaining 13 variables were entered in a second step. Although Model 1 already was statistically significant with 3.8% of variance explained through BMI (Adjusted $R^2= .038$; F (6.420) = 368.78; p <0.05), Model 2 improved predictability by nearly two thirds (Adjusted $R^2= .683$; F Change= 22.496; p= .000), which resulted in a model with 68.3% variance explained by the independent variables. Table 3 provides the results for each variable. Two food-related thinking patterns were identified as meaningful predictors for food thought suppression from the regression analysis, including negative valence of food (B= 12.88; p= .000) and neutral valence of food (B= -2.916; p= .032). Additionally, an educational status of A-levels predicted food thought suppression (B= -.014; p =.005)).

Table 2. Hierarchical Regression for BMI

Step	Predictor	B	P
1	Food Thought Suppression	-.113	.012*
2	Food Thought Suppression	-.083	.304
	Preoccupation with food – Frequency	-1.406	.260
	Preoccupation with food – Positive valence	1.726	.176
	Preoccupation with food – Negative valence	.417	.787
	Preoccupation with food – Neutral valence	-2.208	.073
	Ethnicity – Mixed	-3.604	.361
	Ethnicity – Asian	.400	.888
	Ethnicity – Afro Caribbean	9.71	.002*
	Ethnicity – Other	4.61	.166
	Education – No qualifications	-3.72	.354
	Education – Primary level	-2.83	.602
	Education – GSCE level	-1.19	.709
	Age	0.004	.965

N= 139; SE = Standard error; Food Thought Suppression (FTS)= Food Thought Suppression Inventory; Preoccupation with food = Food Preoccupation Questionnaire

Table 3. Hierarchical Regression for Food Thought Suppression

Step	Predictor	B	P
1	BMI	-.397	**.012**
2	BMI	-.103	.304
	Age	.158	.150
	Preoccupation with food – Frequency	1.167	.397
	Preoccupation with food – Positive valence	2.085	.147
	Preoccupation with food – Negative valence	12.88	**.000**
	Preoccupation with food – Neutral valence	-2.916	**.032**
	Ethnicity – Mixed	-3.668	.407
	Ethnicity – Asian	-2.794	.400
	Ethnicity – Afro Caribbean	1.214	.733
	Ethnicity – Other	6.626	.074
	Education – No qualifications	6.96	.113
	Education – Primary level	-.724	.400
	Education – GSCE level	-.742	.834
	Education – Alevels	.014	**.005**

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N= 139; SE = Standard error; Food Thought Suppression (FTS) = Food Thought Suppression Inventory; Preoccupation with food = Food Preoccupation Questionnaire

Table 4. Hierarchical Regression for Preoccupation
with Food

Predictor	Thought Frequency		Positive valence		Negative valence		Neutral valence	
	B	*P*	*B*	*P*	*B*	*P*	*B*	*P*
Step 1								
Food thought frequency	-	-	.193	.025	.527	.000	-.285	.001
Positive valence of food	.189	.025	-	-	-.416	.000	-.133	.116
Negative valence of food	.576	.000	-.467	.000	-	-	-.256	.004
Neutral valence of food	-.287	.001	-.137	.116	-.235	.004	-	-
Step 2	*B*	*P*	*B*	*P*	*B*	*P*	*B*	*P*
Food thought frequency	-	-	.094	.278	.197	.004	-.287	.000
Positive valence of food	-.101	.287	-	-	-.362	.001	-.137	.116
Negative valence of food	.330	.004	-.566	.000	-	-	-.235	.004

Neutral valence of food	-.272	.002	-.134	.120	-.070	.311	-	-
Age	-.019	.006	-.009	.206	-.015	.006	-.012	.082
BMI	-.007	.260	.009	.176	.001	.787	-.012	.073
Ethnicity – Mixed	-.176	.543	-.606	.029	-.068	.761	-.801	.005
Ethnicity – Asian	-.241	.266	-.405	.052	-.272	.005	-.393	.070
Ethnicity – Afro Caribbean	-.519	.024	-.571	.010	-.218	.104	.170	.467
Ethnicity – Other	-.324	.182	-.457	.051	-.203	.223	-.056	.818
Ethnicity - White	*	*	*	*	*	*	*	*
Education – No qualifications	-.273	.343	-.564	.058	-.624	.279	-.058	.852
Education – Primary level	-.206	.598	.942	.017	.352	.004	.038	.927
Education – GSCE level	-.190	.408	.272	.298	.261	.243	.284	.296
Education - Alevels	.094	.594	*	*	-.169	.141	*	*
Education- Higher education	*	*	.210	.218	*	*	.244	.169
Food Thought Suppression	.005	.397	.008	.147	.033	.000	-.013	.032

*N= 139; SE = Standard error; Food Thought Suppression (FTS) = Food Thought Suppression Inventory; Preoccupation with food = Food Preoccupation Questionnaire, *= Excluded variable*

Factors predicting Preoccupation with Food

Several models for the four subscales of the FPQ questionnaire were calculated, including food thought frequency, positive, negative and neutral valence of food. A high collinearity between dimensions performed during validation of the questionnaire served as a sufficient evidence base for prioritising this factor for the block wise entry (Tapper & Pothos, 2010). Four final models resulted from the analysis that added to explaining variabilities sufficiently, and these were statistically significant for all models (p < .05) with magnitudes between 18% (R^2= .018) for positive valence and 54.41% (R^2= .544) for negative valence.

All significant predictors in regard to the four subscales are reported as follows, while Table 4 provides a more exhaustive overview.

Negative valence of food predicted food thought frequency (B= .330; p= .004), while neutral valence of food (B=-.272; p= .002), age (B= -.019; p = .006) and Afro-Caribbean ethnicity (B= -.519; p= .024) were associated with a lower degree of thought frequency.   Positive valence of food was predicted inversely by negative valence of food (B= -.566; p= .000), having a mixed ethnicity (B= -.606; p= .029), Afro-Caribbean ethnicity (B= -.571; p= .010), meaning that these variables are associated with a lower degree of positive valence. On the other hand, primary level education predicted a higher score for food thought suppression (B= .94 2; p= .017).

Several predictors were identified for negative valence of food: While food thought frequency and food thought suppression predicted a higher degree of negative valence significantly, (B= .197; p= .004; B= .033; p= .000), positive valence of food (-.362; p= .001), age, (B= -.017), Asian ethnicity (B= -.272; p= .005), primary level education predicted lower scores for negative valence. Similarly, lower scores for neutral valence of food were predicted significantly by food thought frequency (B= -.287; p=.000), negative valence of food (B= -.235; p= .004), food thought suppression (B= -.013; p= .032(and mixed ethnicity (B= -.801; p= .005).

Table 5. Pearson's correlation for all variables (n=139)

Variables	1.)	2.)	3.)	4.)	5.)	6.)	7.)	8.)	9.)	10.)	11.)	12.)
1.)BMI	-	-	-	-	-	-	-	-	-	-	-	-
2.)Food thought suppression	p.-.212	-	-	-	-	-	-	-	-	-	-	-
3.) Thought frequency	-.25**	.587**	-	-	-	-	-	-	-	-	-	-
4.)Positive valence	.143	-.214	-.063	-	-	-	-	-	-	-	-	-
5.)Negative valence	-.223	.816**	.646**	-.346**	-							
6.)Neutral valence	0.053	-.504**	-.521**	.007	-.473**	-	-	-	-	-	-	-
7.)Age	.143*	-.239**	-.384**	.095	-.353**	.140*						
8.)White ethnicity	-.190	.184*	.293**	.200**	.190*	-.069	.018	-	-	-	-	-
9.)Mixed/ Multiple ethnicity	-.117	.103	.119	-.152*	.174*	-.229**	-.109					
10.)Asian ethnicity	.0012	-.240**	-.135	.006	-.231**	.012	-.030	-	-	-	-	-
11.)African ethnicity	.312**	-.263**	-.411**	-.094	-.279**	.300**	.175*					
12.)Other ethnicity	.056	.171	.016	-.120	.108	-.047	-.112	-	-	-	-	-
13.)No qualification	-.041	-.058	-.148*	-.156*	-.147*	.074*	-.085	-.72	-.061	.014	.104	.042
14.)Level 1 or below	-.051	.205**	.138	.076	.204**	-.169	-.138	-.050	.142*	-.060	-.062	.109
15.)GSCE	-.042	.107	.042	-.075	.180*	-.021	-.064	.017	.144*	-.107	.050	-.09
16.)A-Levels	-.105	.022	.160*	-.017	.029	-.105	-.217**	.104	-.133	087	-.165*	.007
17.)Higher education	.146*	-.124	-.128	.108	-.129	.119	.300**	-.040	-.015	.009	.072	-.011

Notes. * Correlation is significant to 0.05 level ** Correlation is significant to 0.01 level (2-tail)

In the context of the correlational analysis for BMI, small associations to three out of four scales from the FPQ were identified (see Table 5), including negative correlations for frequency of thoughts ($r= -2.5.$) and negative valence ($r= -.223$), while the link to positive valence, on the other hand, was positive ($r = .143$).

3.3. Weight differences in food-related thinking styles

A one-way ANOVA was performed to detect any significant differences between the different BMI categories and all five food-related thinking patterns, which led to the formation of four distinctive weight groups, including (1) people with underweight (BMI ≤ 18.5), (2) healthy weight ($18.5 <$ BMI ≤ 22.9), (3) a BMI at the upper healthy weight range ($23 - 24.99$), and (4) an overweight category (BMI ≥ 25). All differences with their respective group means and standard deviations are presented in Table 1 (p. 48f).

There were statistically significant group differences for food thought frequency ($p < .05$). A Tukey post hoc test revealed that the underweight group had significantly higher scores than the overweight group ($\bar{x} = 4.4$ (SD= 0.69) vs. $\bar{x}= 3.55$ (SD= 1.0); $p < .05$), and healthy weight individuals had significantly higher food thought frequency compared to overweight people ($\bar{x} = 4.1$ (SD= 1.0) vs. $\bar{x}= 3.55$ (SD= 1.0); $p < .05$). Further significant differences were detected for negative valence of food ($p = .01$) with evident group differences between the healthy weight and overweight subsample ($\bar{x} = 3.29$ (SD= 1.17) vs. $\bar{x}= 2.57$ (SD= 1.0); $p < .05$), and between the underweight and overweight group. However, in the latter case the difference was marginally above the statistic cut-off value of statistical significance ($\bar{x} = 3.44$ (SD= 1.23) vs. $\bar{x}= 2.57$ (SD= 1.0); $p < .05$).

The main interest of this analysis was to identify any statistically relevant variations between participants in the upper healthy weight range and overweight individuals, yet the analysis did not identify any significant

p-values for these two groups in regards to any food-related thinking style. Nonetheless, a few trends can be observed based on a descriptive comparison of the group means (see Table 1, p. 48f): Generally, the group means for different weight categories suggest that food thought suppression and food thought frequency tend to increase for lower weight categories ($\bar{x}$= 49.44 (SD= 20.78) and $\bar{x}$= 4.4 (SD= 0.69) for underweight BMI vs. $\bar{x}$= 39.56 (SD= 18.55) and 3.55 (SD= 1.0) for overweight BMI). The opposite applies to positive valence of food, where people in the higher BMI groups expressed higher scores than those in the lower weight categories overall, as results showed a small mean difference of 0.42 between the lowest and the highest BMI group mean based on scorings on a 5-point Likert scale. A similar observation can be made for neutral valence of food, which indicates a mean group difference of 0.32 between the lowest and highest BMI group. Based on these observations, people in the group defined as being at risk of overweight (BMI = 23 – 24.99) overall tended to exhibit higher scores in food thought suppression, food thought frequency and negative valence of food compared to overweight people. On the other hand, participants with overweight reported a higher degree of positive and neutral valence of food than those with a lower BMI. However, these findings were not statistically significant.

3.4. Themes arising from the Thematic Analysis

A total of three central themes were identified from the present interview narratives: 1) "Why am I all about food?" 2.) "Jekyll & Hyde" and 3.) Emotional attachment to food. Table 10 (p. 63) lists an overview of these themes including additional subthemes, and also provides illustrative example quotes to convey their essential meaning. Given the small dataset (N=6), pseudonyms of participants' names were used individually within the report for a more vivid and individualistic stance of presenting the insights. Relevant demographic participant characteristics are shown in Table 9 (p. 60). While the study mainly focussed on exploring food-related thoughts, most interviewees discussed their eating behaviours and emotions they experienced around food as well.

1. "Why am I all about food?"

The fist distinctive pattern derived from the narratives reveals that food appeared to take on a disproportionally important and dominant role in people's lives. The essence of this theme is captured in a statement by Anna: "I think about food pretty much all day. My life, my mind revolves around food. I don't think I will ever stop loving food". Although food represents pleasure and enjoyment in certain situations, constant ruminating and questioning of past or future food choices can represent a burden as well,

Table 9. Age and weight category for interviewees.

Name	Weight category	Age
Anna	Overweight *	33
Louise	Overweight	31
Stephanie	Upper healthy range **	34
Jane	Upper healthy range	22
Tom	Overweight	35
Charlie	Upper healthy range	39

*BMI = 23-24.99; **BMI ≥25

which suggests that an ambivalent relationship with food may be common. The following subthemes were organised in a way to explore potential sources for this strong preoccupation.

● **"If I see food, my eyes open."**

The experience of overwhelming pleasure and excitement around food was discussed, which was usually not related to physical hunger. As Anna explained: "I don't even need to be hungry. If I see food in front of me, my eyes absolutely open." Louise described her pleasure prior to eating as a "build up" that outweighed any feelings of guilt at that moment, which however would occur afterwards. Moreover, indulging in pleasurable foods,

usually high in fat or sugar, represented an incentive value for some, probably due to the learned awareness and experience of the stimulating physical response. Therefore, food was consciously used to reward a successful achievement of a pre-set goal, as having to earn a particular meal beforehand maximised the pleasurable effect. For example, Anna planned specific days to allow for a "cheat meal" to keep herself motivated to adhere to her strict weekly diet plan ("I feel I can have the ice-cream, because I had a healthy lunch."), while Louise would plan this a special occasion, such as eating in a restaurant with her partner. As they were aware of their "obsession" food, both Louise and Anna consciously tried to replace this with healthier alternative behaviours. According to Louise, her goal was "trying to get away from using food as something to look forward to". She reported engaging in regular boxing classes, which she found created a comparable pleasurable and rewarding experience to eating. Meanwhile, Anna and Tom actively researched and prepared healthier food alternatives to her favourite unhealthy treats.

● **Feeling in control**

Rigid self-monitoring practices (e.g. specific diets or calorie counting) were employed to maintain strict control over food choices. For example, Stephanie detailed: "I set the goal calories to 1.600, but as soon as I hit 1.200, I start getting really anxious about eating more." Individual underlying motives somewhat differed between participants: While Anna and Louise were primarily hoping to lose weight, Stephanie additionally used food as a way to structure her life and occupy herself. Interestingly, her initial intention to reduce weight did not fulfil her positive expectations of feeling happier after she succeeded. Instead, it was the process of constantly planning and organising her meals based on a specific number of calories that triggered positive thoughts and emotions. Her explanation was that her detailed knowledge about calories in food items contributed to a positive self-image, and provided a sense of "control where there is not much else to control". In addition, planning her meals reduced the burden of decision making for her as she explained: "There is no decision, it is already planned. When I go to the shops, there is a lot less anxiety, because I already know exactly what I want to eat".   For Jane, on the other hand, being in control of

her gluten intolerance was her main motivation to monitor her diet. She struggled to eat by herself due to negative thoughts about food that she found distressing, which she described as "almost like a phobia" and feeling "blocked at the thought of having food". This had significant consequences, as this meant she was only able to consume her food in the form of liquid shakes or eating in the company of others, mostly in restaurants, to distract herself. In contrast to the positive influence of a social environment, rigid food rituals had a detrimental effect on social life in other instances. Louise and Stephanie admitted missing out on social events and outings to avoid deviating from their food schedules, as they feared that restaurants were unable to accommodate their dietary requirements. This is evident from a quote by Stephanie: "I used to love going out to restaurants, but now I'm thinking 'How do I count the calories in the foods?' I try to enjoy myself, but I can't." To better cope with the burden of sticking to a restrictive diet, Louise, Jane and Anna aimed for balance in their diets by incorporating "forbidden foods" in moderation, as both Louise and Anna agreed that ruling out unhealthy foods altogether was unrealistic. Anna elaborated: "Being 100% only pure, clean eating … I could do it for a while but I would go back into the bad old habits."

- **Pursuit of a positive body image**

This subtheme captures the eminent pursuit of achieving a particular body shape by adopting healthy eating habits. As women tend to be particularly preoccupied with fulfilling this internalised ideal, it is not surprising that this attitude was more relevant in the female interviewees. The described ideal body shape usually mirrored the common Western ideal for women of slender to skinny body frame. It is notable that food was frequently referred to in a different way to its conventional purpose of fulfilling basic physical needs. Instead, in many instances external cues appeared to be more relevant (e.g. "healthy" ingredients equal weight loss). Several narratives demonstrate a general sensitivity to the societal perception of their body weight, especially within the closer social network, which is likely to be an underlying factor for a strong preoccupation with food. For example, Stephanie and Louise described how being "body shamed" had

Table 10. Overview of the themes identified through Thematic Analysis.

Overarching theme	Subthemes	Example quote
1. "Why am I all about food?"	"If I see food, my eyes open."	*"I love food, for me it's excitement. I don't even need to be hungry. If I see food in front of me, my eyes absolutely open."*
	Feeling in control	*"If I am able to control something unhealthy, then I have achieved something."*
	Pursuit of a positive body image	*"I've always had distorted views of my body and I've never felt comfortable about the way I look. (…) I have always used food as a way not to think about my body."*
2. "Jekyll & Hyde"	"It's taking over like an addiction."	*"It's almost like a need to have food, to have it in my hands and to stuff myself. I am like a food monster! I just gobble it down."*
	„I'm doing this to be healthier"	*"I remember the positive things to why I am doing that, I actually try and lessen the pleasure of it, by trying to think 'I have eaten it, it was nice, but was it worth it?"*
3. Emotional attachment to food	"I just want the comfort of food"	*"Generally when I am stressed or sad, I will eat more because food can be comforting – it's like a companion. I would almost call it my best friend."*
	"Food brings people together"	*"Growing up, barbecues were something that I remember enjoying very much, so having a big backyard with my parents inviting lots of people and playing games."*
	"Food is fuel"	*"Your body needs fuel – so just like with a car, if you don't put gas in, it's not gonna, you know, work for you"*

affected them in the past. Stephanie elaborated: "Somebody very close to me told me 'You have enough fat to survive the winter without eating' and that really hurt my feelings. I was like 'Yeah, maybe you're right'."

Furthermore, the prevalent social pressure was emphasised by a reoccurring for comparisons against others who were seen as slimmer or fitter, which often triggered negative self-beliefs and emotions. As Anna elaborated: "It's hard when being with people who can eat and eat, and just don't know the struggles that probably people like me who gain weight quite easily." Therefore, being aware of the direct impact of food on their body was seen as an effective measure to improve body image and reduce negative beliefs, which is indicated by Stephanie: "I use food to not think about my body". In alignment with the desire to for eating healthily, there was a common tendency to follow certain role models that served as an external orientation to validate food choices, which either were people from their own social network (e.g. friends) or celebrities. For example, Louise felt motivated by a celebrity, who had recently lost weight ("This inspires me to think 'If she can do it, then I can do it.'"). She also adopted her spouse's particular dietas seeing him succeed in it made this method credible and relatable for her. On the other hand, Anna's inspiration were predominantly actresses and models who are seen as conventionally thin by society, which appeared to result from an internalised ideal over many years. She explained: "When I was younger, I used to think in order to be skinny, I would have to eat lettuce. I wanted to be like the actresses." Interestingly, she also referred to the same role models to justify her unhealthy food choices: "Once doesn't kill, you know, and even the top models eat McDonalds here and there, so it doesn't really make me feel guilty."

2. "Jekyll & Hyde"

This theme describes a constant balancing act between maintaining healthy eating habits and giving in to appetite cues or cravings. Participants tended to experience this as an internal conflict between good and evil, as Louise emphasises: "It's a bit like Jekyll and Hyde", where intentions of

eating healthily, or "making the right choices" as phrased by Louise, were repeatedly challenged and jeopardised by urges to give in to cravings or appetite for "bad" foods.

- **"It's taking over like an addiction."**

Despite constant efforts to practice healthy eating and portion control, some of the interviewees admitted struggling with overeating. This behaviour was characterised by a consumption of copious amounts of food, usually high in sugar and fat, combined with difficulty to control or limit food intake. The underlying thought process is best encapsulated in a quote by Louise: "That feeling of guilt doesn't come in before. All the negative things about food don't seem to… get pushed aside". Louise and Anna went as far as comparing the overwhelming sensations they experienced with substance addiction, as they found that it provoked a similar reward response in their body. This link is evident in Louise's narratives, as she recognised: "I think it's really quite a dangerous thing (…) because you are using it in a way that basically is drug abuse". Giving in to overeating was often followed by negative feelings, as it represented a major deviation from participants' ideals and values of "eating right", hence in some cases it appeared to equal personal failure in attaining a personally meaningful goal. The negative impact on the self-image becomes clear as participants used negative personality traits to describe themselves in this context, for example greed or impulsivity. This becomes evident in Anna's characterisation: "I am the greediest person in the world. So every food I see – I am like a food monster. I just gobble it down." Despite repeated efforts these individuals felt that they were unable to control their urge to overeat, and consequent restriction and resisting to desired foods was even more counterproductive ("I feel the more times you try to not eat something, the more … it takes practice. (Louise)").

- **"I'm doing this to be healthier"**

Considering the high degree of distress and negative thinking following the excessive food consumption, multiple coping strategies were utilised to control the urge to give in to overwhelming food cravings. They differ in regards to the time point, as some strategies were applied to remove triggers, while others were specific ways to deal with the aftermath of a food binge. For example, Louise proactively attempted to replace her "obsession" with food by attending exercise classes, which she found created a similar physical response, as it made her "full of endorphins". Additionally, she consciously envisioned positive future outcomes of maintaining healthy eating habits, as she describes: "I remember the positive things to why I am doing that, I actually try and lessen the pleasure of it, by trying to think 'I have eaten it, it was nice, but was it worth it? Probably not.'". In order to reinforce her motivation to abstain from overeating in advance she would watch TV shows demonstrating the negative effects of obesity in real-life cases that demonstrate the negative consequences on quality of life. Stephanie, on the other hand, attempted to distract herself by occupying herself with cognitively engaging activities, such as university assignments or mobile games. Another way to prevent struggling with overwhelming food cravings was mentioned by Anna, who scheduled in a "cheat day", where she allowed herself to indulge in any food, with the aim of having the willpower to "stay on track" on other days when was on a strict diet. Avoiding triggers that knowingly increased the likelihood to overeat was specified as another way of coping for Stephanie and Louise, who admitted abstaining from social events that involved a buffet or eating in a restaurant, if they feared having no option to stick to their healthy diet. To deal with the aftermath of overeating Tom and Stephanie adopted compensatory measures the following day by eating less than usual and going to the gym to burn of the excess calories. The common tendency of reported coping styles is that they all target maintaining or re-establishing a healthy eating pattern, rather than addressing the underlying factors, such as the described addiction. Therefore, it is questionable how effective these strategies are to prevent binge eating, as none were explicitly pointed out as being particularly successful.

3. Emotional attachment to food

The third prominent theme encapsulates the common tendency of attributing eating behaviours to feelings and mood states, for example stress, happiness or depression, in most participants. A quote by Anna captures the essence of this theme: "I eat although my body doesn't require it or need it, either for a sense of happiness or whatever emotions it might bring up."

● **"I just want the comfort of food"**

In many instances eating took place in response to negative emotions. For example, both Anna and Tom described eating more than usual when they were feeling sad or lonely (e.g. following the end of a relationship), because it made them feel happier. For Anna, food appeared to offer her emotional support and comfort, similar to that provided by a close friend, suggesting an unusual emotional bond to food: "I will eat more because food can be comforting. It's like a companion almost, especially when you are living alone it is right there". Although she recognised that eating in response to her feelings was neither an effective, nor a healthy coping mechanism, her positive sensations outweighed the consequences at that moment ("I don't want to think, or to know... I just want to eat and have the comfort of food.").

● **"Food brings people together"**

This subtheme describes the common internalisation of food culture, which is shaped throughout the life course and is most likely based on societal food rituals. For example, Tom mentioned explicit ceremonies associated with specific meals, such as cakes for weddings or birthdays and barbecues on summer parties: "Growing up that was something that I remember enjoying very much, so hopefully that will continue to be passed on from generation to generation". Therefore, positive memories and nostalgic feelings automatically emerge, which probably stem from the social bond over sharing food with relevant others. Moreover, Tom gained self-confidence from the positive appreciation and praise of his cooking skills by his friends. While there was a general positive emotive connection between socialising and food, there was one exception; for Charlie, eating in

the company of relevant others made him feel "forced" to eat, which resulted in an aversion towards family meals. Hence, he reported eating much less than usual in these situations.

- **"Food is fuel"**

In contrast to the commonly described emotional connotations, Charlie and Tom tended to take on a primarily rational approach towards food. This is captured in a quote by Tom: "At the end of the day your body needs fuel – so just like with a car, if you don't put gas in, it's not gonna, you know, work for you". For others, this approach also served as a coping mechanism, as Jane described how she had internalised "food is fuel" like a mantra with the aim of detaching from her negative thoughts about food. She pursued her interest and determination to practice the right nutritional approach by actively educating herself about different foods, which had gone as far as resulting in her achieving an academic degree in this field.

4. Discussion

4.1. Key findings

A regression analysis including all quantitative variables revealed that there was no significant link between the participants' body weight and Food Thought Suppression or Preoccupation with Food. Overall, Afro-Caribbean ethnicity was the strongest predictor for having a high BMI, and people of this racial group also tended to think about food more frequently and more positively compared to other races. Person's correlations suggest that a weak tendency exists for people with a lower body weight to engage in more frequent food-relate thoughts, which also tended to be more likely negative than neutral or positive. Notably there was a particularly prominent relationship between food thought suppression and negative thinking, as both variables predicted the other. Furthermore, younger participants tend to experience more frequent and negative thoughts to a higher degree compared to older individuals. Most of the four subscales part of Preoccupation with Food are respective predictors, which is not surprising, considering the findings discussed in Section 2.1, and validates their separate consideration in the first step of the regression models. Finally, people with a relatively low education level (primary level) tend to express a higher extent of both

positive and negative valence of food. Although this link may appear contradictory at first, it suggests that individuals may display a stronger vulnerability to evaluate food, either positively or negatively, suggesting a stronger emotional component while engaging in food-related thinking.

Additionally, the qualitative findings helped identifying potential sources of high preoccupation with food: Firstly, a negative body image could explain a high interest in food with aim as it is perceived as a mean to alter body shape, which appears to be particularly relevant for women. Moreover, its incentive value of creating a physical reward response and consequently leading to positive feelings and expectations, as well as a need for control and security that is found in rigid monitoring of food intake is a central mechanism in regard to the personal meaning food can have, which encourages certain eating patterns, such as strict dieting or binge eating. Most people appear to have a somewhat conflicting relationship with food, which is evident from the constant balancing act between eating "right" and giving in to urges to indulge in pleasurable foods, which are considered unhealthy.

Interestingly, food-related thoughts were usually not easily accessible during conversations with participants- particularly negative ones: Although difficulties with food-related thoughts were mentioned frequently, they were only elaborated to a limited extent and with big difficulties. Hence, it is not surprising that only scarce effective coping mechanisms to address underlying thoughts and emotions have been adopted successfully, as the general focus appears to be on the reuptake and maintenance of healthy eating behaviours, or the prevention of future episodes of overeating.

The role of emotions therefore is equally important for being able to understand people's relationship with food and underlying processes explaining individual eating behaviours, as thoughts seem to be directly connected to emotions and behaviours for underlying processes of eating behaviours.

Some degree of consistency can be observed when comparing the quantitative with the qualitative outcomes of the study: Across the two parts of the study it was demonstrated that a positive valence of

food, both on a cognitive and emotional level, appears to be linked to a higher body weight, while people with a lower body weight tend to think about food more frequently, which is predominantly characterised by negative thinking. However, qualitative research suggests that gender may have a larger contribution than weight in predicting the nature and strength of food-related thoughts, which may explain the weak correlations between BMI, food preoccupation and food thought suppression in the quantitative outcomes. While women's descriptions about their relationship with food appear to be highly complex and emotionally charged, men showed a more rational and neutral approach to eating by adopting the view of food as fuel. Moreover, dieting is likely to act as a moderator variable between the female gender and food-related thoughts, as all female participants expressed a strong dependence of their food choices on their internalised reference system, which served as categories of "good" and "bad" foods. Considering the small sample, these are only preliminary assumptions based on prominent patterns coming from the interview narratives, therefore this observation needs to be interpreted with caution, and is not sufficient for generalisation.

4.2. Considering the quantitative findings in light of available literature

The quantitative findings show that food thought suppression and preoccupation with food do not deliver statically meaningful explanations for obesity, which suggests that cognitive factors may not be as relevant for weight gain as it assumed based on the existing literature on this topic. An explanation for the non-existing link may be that different thinking patterns are better predictors for obesity, which have not yet been recognised and operationalised as a standardised measurement tool.

On the other hand, there are several observations of differences between weight groups in regard to food-related thinking patterns: A remarkable outcome was that lower, rather than a higher, BMI was linked to higher scores for the majority of thought constructs,

particularly for food thought suppression, preoccupation with food and negative valence. This indicates that these thinking styles may assist as coping mechanisms in limiting food intake and consequently aid in maintaining a lower body weight. This observation corresponds to findings from a study that identified food thought suppression as a possible mechanism for weight management (Reed et al, 2013). However, other researchers have consistently linked this construct with a higher body weight, which contradicts to the present study results (Barnes et al, 2010; 2011).

In terms of interpreting the predictor model for preoccupation with food, findings suggest that people who engage in more frequent thoughts about food, tend to have a more negative, rather than neutral or positive, connotation to food. As there was no significant link between any of the subscales and BMI, this means that for this hypothesis, H1 can be rejected with a high probability, which assumed that preoccupation with food is linked to a higher BMI. This finding is supported by evidence where a high negative valence of food was associated with a lower positive or a neutral attitude towards food. Furthermore, both frequent and negative thinking have high correlations to food thought suppression, which indicates that people may try to limit the burden of these negative thoughts via suppression. This, however, does not appear to be effective, as the model indicates that their thoughts persist considering their high magnitude. However, the present findings are inconsistent with previous evidence in regard to BMI, which have found associations between a high BMI, negative valence of food and food thought frequency (Glaser 2015; Bond et al, 2011). A possible explanation for this discrepancy may be that a significant proportion of the sample may have been dieters, who knowingly are more preoccupied with food as a result of their constant reinforcement of healthy eating strategies (Elfhag et al, 2004). Hence, their tendency to ruminate about their food choices in a more complex way compared to non-dieters means that they take multiple external factors into account, such as internalised diet rules, which eventually prevent weight gain as they will be less likely to follow their natural

hunger cues, but rather use external cues and norms as a guidance that dictate dieting and food restriction. On the other hand, people with overweight were less preoccupied with food and evaluated food in a more positively, which suggests that they feel more disinhibited to engage in overeating, as they are possibly less likely to ruminate or encounter distress prior to eating.

In terms of understanding risk factors for weight gain, the most significant finding was that an Afro-Caribbean ethnicity was found to be the strongest predictor for a high BMI. This adds further evidence to previous statistics highlighting racial disparities in the context of body weight, which found that in the UK, children of Black Caribbean origin are at greater risk of being overweight, while in the US, African American adults are 1.5 times more likely to be obese compared to white adults (Zilanawala et al, 2015; McKernan et al, 2014). This is particularly concerning, considering that there is an increased risk of developing weight-related health complications, such as diabetes, for people of African or Asian ethnic background living in the UK compared to the white population, even if their BMI is under 25. Therefore, it is not surprising that UK-based people of Afro-Caribbean origin are three times more likely to develop type 2 diabetes in comparison to the Caucasian population. Scattered body of evidence has suggested reducing the BMI threshold of overweight from 25 kg/m^2 to 23 kg/m^2 for black populations, and bringing the obesity cut-off down to 26 kg/m^2 instead of the suggested 30 kg/m^2 (Nice, 2013).

Previous research has linked a low educational level with overweight (Voegelers & Fitzgerald, 2001), however this was not supported by the present findings. Regarding the relationship between education and thinking styles that was investigated, interestingly people with either a low or high educational level thought about food to a lesser degree. A possible explanation could be derived from the general stronger mental engagement in people with higher education due to a stronger emphasis on academic and career achievements, hence they may have less capacity to reflect about everyday routine activities, such as eating. Moreover, existing evidence highlights a

link between low educational status and low socioeconomic classes who have higher prevalence of low-income jobs or unemployment (Ladd, 2012). Living with a limited income often requires managing financial difficulties and other daily life stressors (Kim et al, 2013), which could require a stronger prioritisation of cost and availability of food, limiting the choice of food and therefore the likelihood to reflect about food choices. Similarly, the relationship between low literacy and detrimental health outcomes, including higher obesity rates and associated health conditions such as diabetes, has been well-established (Falkner et al, 2001; DeWalt et al, 2004). Indeed, the present study has identified a weak relationship between poor education and a higher body weight, which is consistent with this finding.

4.3. Considering the qualitative findings in light of available literature

While quantitative research did not identify relevant cognitive predictors linked to a higher BMI, the qualitative insights revealed meaningful thought patterns in more detail, and also suggested that there may be several differences in attitudes and emotions around food across both studies weight groups (upper healthy range vs. overweight) based on their descriptive self-reports.

For people with overweight, their relationship with food appeared to be emotionally charged, while people at risk of overweight tended to take on a more rational approach on how they refer to food, which was mostly expressed by higher rumination and concerns regarding their food choices. This observation is supported by a robust body of evidence, which has established tendencies to overeat regardless of hunger in obese individuals, for example in response to negative emotions, triggered by situational cues (e.g. availability of food) or psychological stress (Elfhag et al, 2004; Merhebian 1980; Schlundt 2000).

However, a greater difference regarding cognitive and emotional factors on eating behaviours were observed between genders: All four

women reported following a prescriptive diet involving a strict routine with specific eating and monitoring behaviours, for example sticking to a specific number of calories, avoiding specific food groups or preparing meals with particular ingredients. Often, this impacted on their social lives to a great extent, as they were inclined to avoid socialising in restaurants or social events revolving around food. Reasons for dieting or pursuing weight loss were similar in both weight categories in terms of health benefits, although for overweight women a desire to alter their body size appears to be the main driver that initiated their decision to gain control of their eating. Furthermore, women seemingly were more susceptible to social influences than men, as social presence acted as an important motivator for them in the process of controlling their food intake, as some feared negative evaluation through their social environment. Rumination and preoccupation with food were more common amongst women compared to men, however it is unclear if this is gender-related or a result of being on a diet. It is possible that dieting moderates effect of gender on this thinking style.

A possible explanation as to why food tends to consume women's minds to a bigger extent could be their notably high personal relevance of their body image, which was often associated with their thoughts and relationship with food. Associating food with a personally relevant and sensitive aspect of their self-image may alter the originally neutral or rational meaning of food as fuel into an emotionally laden topic which is complicated by various attached meanings around their perceived body image. Therefore, dissatisfaction with their body shape is attributed to food, and is manifested in the form of negative thoughts and emotions. Hence, over time their negative body image may project into a negative relationship with food. This also could offer a reason explaining why men, who probably were exclusively non-dieters, did not express having a negative body image and generally displayed a more positive or neutral attitude towards food. These outcomes are mirrored consistently across the evidence base: It has been established that women express higher scores in food preoccupation and food

thought suppression (Barnes 2011; Tapper & Pothos, 2010), which often is a result of a strong preoccupation with their weight and body shape leading them to attempt weight loss by limiting food consumption (Beardsworth, Brynan & Keil, 2002). Their strong drive for thinness is likely to be driven by societal norms and pressure, especially in the Western culture (Darlow & Lobel, 2010). Furthermore, dieting has been linked to weight gain following the diet, which is additionally triggered by dissatisfaction with weight, dichotomous thinking, and evaluation of weight and shape (Byrne, 2003). All these characteristics did occur in the women of the present sample and support the sabotaging nature of these thinking styles. The common pattern between healthy eating and a perceived sense of control and positive self-identity further consolidates a positive evaluation of dietary behaviours. This finding is supported by other research, which identified a link between dieting and positive aspects of identify, such as self-accomplishment and confidence (Musavian et al, 2014).

Dichotomous thinking and categorising food items into "good" and "bad" foods, which tended to cause a constant internal conflict, occurred in women regardless of weight status, while men used more neutral categories, such as the meal time or social events to refer to particular foods. The nature of this thinking style has been described previously in obese women, where it has been linked to dichotomous thinking and a higher body weight (Freeland-Graves &Nitzke, 2013). Therefore, it is likely to contribute to weight gain over time, as the present study suggests that it already takes place in women at risk of weight gain.

For women at the upper healthy weight range, the environment of their meal appeared to be extremely relevant: Being in others' company during meals was perceived as a pleasant distraction from negative thoughts around food. Other research has found that distraction due to others' presence during eating can facilitate eating bigger portion sizes as the ability to self-monitor is impaired (Hetherington et al, 2006), which offers a plausible explanation why

women may be less concerned about pursuing their usual diet in these situations.

Several coping mechanisms were mentioned in the context of dealing with difficult emotions and thoughts about food, including positive self-talk, adopting a rational approach to food by seeking knowledge about nutrition, avoiding situations that trigger overeating, and reframing negative thoughts as positive ones. Some of these strategies have been previously deemed useful in the context of food-related concerns, including seeking nutritional knowledge (Miller & Cassady, 2012), positive self-talk (Puhl & Brownell, 2006), experiential avoidance (Lillis, Hayes & Levin, 2011) and positive reframing (Faries & Bartholomew, 2015; Slyter 2012).

Notably, while individuals at the upper healthy weight range predominantly discussed struggling with negative thoughts and emotions around food, people in the overweight group, on the other hand, found controlling their food consumption more challenging. At the same time they generally indicated a more positive attitude and emotionally charged relationship to food. This was expressed by strong arousal, such as excitement and happiness, prior or following eating, as well as nostalgic positive memories in the context of food. Lack of control in regard to food consumption and positive emotional arousal has previously been related to a higher body weight in the context of the food-related attentional bias (Tapper et al, 2008; May 2010). Food also represented an incentive within the overweight group, which was consciously used to reward themselves or others. This could further stimulate their temptation to eat as a result of positive associative learning, which has been identified as a relevant factor influencing food choice (Furst et al, 1996). Alternating between binge eating behaviours followed by compensating through restricting food and exercising tended to be more common in overweight participants. Episodes of overeating were triggered by both external and internal emotional cues. External triggers included the availability of food provided by others, stress or boredom, whereas internal triggers often were negative or positive emotions and perceived

personality traits, such as impulsivity. Recent evidence, including a systematic review, has listed these cues as contributors to overeating and higher body weight (Devonport, Nicholls & Fullterton, 2017; Murphy, Stojek & MacKillop, 2014). Moreover, impulsivity and loss of control around food was discussed in the context of a suggested food addiction, which stemmed from the high physical reward response based on the overweight respondents' narratives (Tapper et al, 2008; Murphy, Stojek & MacKillop, 2014).

The most common coping mechanisms to reduce overeating included imagining future outcomes of adopting a healthy vs. an unhealthy diet, problem-solving through the identification of triggers associated with overeating and finding adequate coping strategies (e.g. ensuring access to healthier meal alternatives or situational avoidance), and the replacement of eating with alternative activities that led to a comparable reward response. These strategies provide potential directions for effective weight loss interventions, and some of them have previously been identified in the context of maladaptive eating behaviours, including the mental self-projection to pre-experience future events of current eating styles (Sze et al, 2015), problem-solving skills (Slyter 2012; Murphy et al, 2010) and engaging in alternative activities related to feelings of mastery and pleasure (Baer, Fischer & Huss, 2005).

4.4. Linking back to theoretical framework

The Conceptual Model of Food Choice (Furst et al, 1996) was used to inform the hypotheses for the qualitative research, as this was deemed an appropriate framework for not only understanding food-related thoughts, but also for exploring the individual relationship with food in more detail by identifying reference points that guide participants' food choices, as well as relevant motivations and values behind these. It is important to understand underlying factors for food choices encourage individual eating behaviours that are linked to weight gain to inform weight loss interventions. This approach presumes a cognitive approach and takes into account food-related

beliefs, attitudes and thinking styles. While the main interest of the study was to explore cognitive factors involved in weight gain, it is important not to undermine relevant emotions that are involved in this process. The role of emotions is addressed in the cognitive behavioural model, where thoughts only occur in combination with emotions. This bi-directional link results in a triangular pattern of thinking, feeling and acting (Beck, 2011). Based on these considerations, the Conceptual Model of Food Choice is able to contextualise the findings, as they are not limited to the cognitive and emotional contributors to eating habits, but also to include the wider social context that interacts with personal factors (Furst et al, 1996). According to the model, there are three main categories which are used to develop an individual's process-oriented system that predict the final food choice they make. Below is a description of these categories in the context of the qualitative outcomes of the present study.

- **Life course**

The life course defines the underlying basis for all other factors affecting food choice, as it often can predict situational circumstances of the food environment. This system presumes that each person is exposed to social, cultural and physical environments over their life course, which result in automatic or deliberate roles that are adopted by the individual.

This system can be found as a relevant influence in light of the present findings of the study: The sample narratives that people have developed an automatic and internalised pattern to guide their food choices in everyday life. This can start as early as in childhood, when positive memories and meal traditions are formed, and this tends to have a lasting impact as they often have a nostalgic meaning stemming from earlier memories. As a consequence, these patterns and rituals are maintained to re-evoke these positive emotions. Later in life social influences within the family and peers become increasingly important, which can result in concerns around body image through others' comments or social comparisons. On the other hand, certain role

models with a certain body ideal, either from the social network or the public, act as positive motivators to pursue particular eating habits, which were accredited to weight loss. Role strain, especially resulting from a busy lifestyle of maintaining a demanding job or being a parent, could make a regular eating pattern challenging. This means that personal values that dictate eating behaviours tend to lose importance, as the person is predominantly driven by external factors.

- **Influences**

This domain represents deliberate or automatic processes that can alter food choices, and include ideals, personal factors based on physiological or psychological needs and preferences and available resources (Furst et al, 1996). While hunger cues and availability of food primarily affect food choice for men, for women, their ideals regarding health consequences and body shape are more important indicators for their food choices. Emotions and mood states, on the other hand, tend to predict under- and overeating in overweight individuals. Food has different symbolic meanings for most people, however overweight people appear to have more explicitly positive associations, including reward, pleasure and comfort, while people at the upper healthy weight range may be more likely to consider it as fuel or as a way of pursuing structure and security by monitoring their diet rigidly. Moreover, women relate their food intake to personal evaluative characteristics, such as lack of control, greed and impulsivity in the context of negative food habits (i.e. overeating), or to being a perfectionist in situations of eating behaviours they see positively, such as portion control.

Imposed eating styles coming from the social context, such as family members or entertainment at work, can present an additional source of stress if this contradicts to preferred personal eating habits. Interestingly, overweight people find it particularly hard to resist to these influences. Another example for discounting own ideals and

values in favour of external influences can be participating in social events or socialising with friends, as this usually involves indulging in foods deemed unhealthy and can be distressing for both healthy and overweight dieters.

Time appeared to be an additional relevant resource for planning and following a particular eating plan as part of a diet for women, while availability of food through relevant others or work environments dictates mens' eating patterns to a bigger extent.

- **Personal system**

The personal system about food choices evolves from a combination of the individual life course and additional internal and external influences, which result in automatic, habitual choice patterns and value negotiations (Furst et al, 1996). The nutritional value of a meal was an important reference point in regards to food choices for most, especially in women, which resulted in a rigid set of rules of avoiding certain foods, especially bread, fast food and sugary treats, which were labelled as 'bad' or unhealthy, often in relation to a particular diet method they followed.

Sensory perception and preference could play an additional role, and result in choosing unhealthier options, as the pleasure outweighed the detrimental health effects in some instances, and because having a balanced non-restricted diet was an important goal.

Moreover, instrumentalising food intake served as a tool for negative and positive reinforcement with relevant others, especially children, who were rewarded with favourite treats after specifically agreed achievements. Managing relationships with food was described by another participant who sacrificed his preferred eating rituals by adapting to his partner's pattern.

4.5. Strengths and limitations

A clear advantage of the study is the use of a mixed-method design, since the isolated use of either quantitative or qualitative

research comes with several specific advantages and disadvantages (Creswell 1994; Atieno 2009). Therefore, researchers are increasingly championing the use of a combined approach of both strategies to overcome respective limitations within social sciences (Morse 2005). In the present study, using a semi-structured interview with open questions allowed for a high degree of flexibility in exploring and identifying additional relevant food-related thought patterns in more detail. This allowed more detailed and rich descriptions of experiences and attitudes to inform the specific cognitive processes and underlying motivators for these. Therefore, the qualitative study component turned out to be highly useful for complimenting the results of the quantitative analysis, as it provided additional, valuable insights to further consolidate and expand the statistical outputs.

On the other hand, the present study suffers from some limitations that need to be considered when interpreting the outcomes. Regarding the quantitative analysis, including gender as a variable in the predictor model would have been a viable option, as the qualitative outcomes highlight considerable discrepancies in food-related thinking styles that may be attributed to gender differences. As this limitation is a result of a strong underrepresentation of men in the sample, future studies need to address and overcome the problem of balancing out the gender ratio in the recruitment process in the context of food-related topics. In contrast to an overwhelmingly strong interest and high response rate in women, relevance for men around diet-related issues appears to be relatively low. This supports the existing knowledge that women generally express a higher personal meaning of food, which likely stems from their strong association with body image. Future research needs to account for this problem by proactively engaging men in participating to allow a more detailed investigation in regards to gender differences in food-related thought patterns. Moreover, the study did not assess dieting status as part of the demographic survey. Doing this would have been useful with previous research and current insights suggest that this variable is likely to affect food-related

thinking styles. The recruitment advert may have predominantly attracted a population with a high interest in nutrition as a result of being on a diet, therefore dieters may have made up a significant share of the sample, and this effect was possibly neglected in the quantitative analysis.

A limitation in the qualitative research part is the small and homogenous sample. Based on the quantitative data trends, demographic characteristics are likely to play a role in predicting BMI and certain food-related thinking styles. Hence, a larger and more heterogeneous interview sample would have been desirable to achieve higher variability across demographic variables, particularly in regards to ethnicity and age. Since all participants from the present sample were exclusively Caucasian and mostly between 30 and 40 years of age, this means that the results from the qualitative survey are merely vague indicators that need to be interpreted with prudence.

Regarding the classification of weight categories, the Body Mass Index offers limited comparability for activity level, body composition and ethnicity, as reflected in Chapters 1.2, and 4.1. This issue was recognised prior to conducting the study, and in the process of interpreting outcomes, however due to lack of existing feasible and valid alternatives the BMI was deemed the only currently available method to appropriately distinguish between underweight, healthy and overweight participants.

4.6. Review of existing interventions targeting obesity

In this section different approaches to target obesity, including treatment and prevention, are discussed to provide an overview of the current landscape in the UK and to reflect on any gaps in their ability to address relevant underlying cognitive and psychological factors that have been discussed in the Introduction.

The emerging obesity epidemic has been addressed by attempts to intervene at many levels, however most interventions targeted at weight loss do not have successful long-term outcomes (Kearny et al, 2012). A weight

loss of 5% is considered clinically important, as this cut-off level has been linked to improvements for several cardiovascular risk factors, including high blood pressure, glucose and lipids (Stevens, Truesdale & McClain, 2006). Unfortunately, weight loss is difficult to achieve and even harder to maintain. On average, half of the weight that obese individuals lose initially is gained back within the first year after weight loss, and approximately 80% of individuals who lose weight return to their initial weight within three or five years (Byrne et al, 2003). This suggests that commonly prescribed interventions with a focus on the restriction of caloric intake and food types may not be effective in fostering sustained weight loss and may fail at targeting the underlying factors that are involved in initial and continuous weight gain. Eating behaviours that are known to be present in relation to unhelpful thought patterns, such as preoccupation and cognitive restraint, are not typically addressed in weight loss interventions and may contribute to the lack of long-term clinical efficacy in present common interventions (Daubenmier, Kristeller & Hecht, 2011; Kristeller & Wolever, 2011). Championing psychological treatments with a focus on unhelpful thoughts and emotions, for example Cognitive Behavioural Therapy and mindfulness-based concepts, may be more appropriate to address particular thinking styles associated with weight gain (Shaw et al, 2009; Daubenmeier et al, 2011).

Despite obesity prevention being described as the most practical, cost-effective and effective way to combat the high prevalence of overweight and obesity among adults, existing programmes have demonstrated limited effectiveness in preventing weight gain, which suggests that the predominant focus on lifestyle behaviours may not be the most appropriate method to facilitate maintenance of a healthy body weight (Hutchesson et al, 2015; Flodmark, Marcus & Britton, 2006; Kamath et al, 2008).

Interventions in clinical practice

Primary care represents an important and accessible setting for obese patients to seek support for weight reduction. The first line interventions for treating obesity in the UK include the provision of lifestyle advice, referral for weight management, prescription of anti-obesity drugs and, in cases of

more severe obesity, referral for bariatric surgery. A stepped weight management approach is widely adopted throughout clinical practice, which prescribes a gradual increase in physical activity combined with step-by-step restriction of calories (Booth, Prevost & Guilford, 2015; BPS, 2011). A survey conducted in 2001 revealed that a fifth of obese patients were offered dietary counselling, less than 5% a referral and 2% anti-obesity medications over an 18-month period. A more recent study demonstrated that 90% of overweight patients do not access any treatment to manage their weight, and among obese the prevalence rates were also high for individuals who did not seek any interventional support (59%). Additionally, the study revealed that weight management interventions are accessed more frequently by women, older patients and by those with health comorbidities. However, utilisation of follow-up services was generally low for the entire population. Therefore, overall findings indicate that there is a likely lack of access to appropriate weight management interventions in the UK (Booth, Prevost & Guilford, 2015).

Adding to the general lack of utilisation among high risk populations, the majority of weight management treatments have demonstrated high prevalence of relapse after weight loss and failed long-term efficacy following the completion of diverse healthcare treatments, which aligns with the findings of poor follow-up rates (Dombrowski et al., 2012; Moffitt et al., 2015; Munsch, Meyer, & Biedert, 2012). Weight loss interventions, such as conventional dietary restriction, medication therapies (orlistat, sibutramine, phentermine, and herbal preparations), and bariatric surgical treatments have shown some success however, (Popkess-Vawter & Kramer-Jackman, 2011). In common clinical practice obese individuals are referred to obesity services run as community-based programmes by their healthcare team. These include public healthy eating guidelines, commercial weight management programmes or exercise related programmes that operate from local leisure centres. Although a few techniques involved in such programmes include some basic cognitive behavioural therapy and motivational interviewing training, community-based intervention programmes often have a short duration, for example of 12 weeks. Research suggests that any behavioural change activity is required for a duration of six

months or longer to prevent relapse (Biddle & Mutrie, 2008). Adding to the lack of follow up, the programmes being utilised by healthcare teams appear not to promote intrinsic motivation sufficiently, which may affect adherence to weight-related behaviours.

Overall it can be concluded the challenge lies with long-term weight management, which is not guaranteed by solely focussing on decreasing weight assisted by dietary and surgical measures. As discussed in the Introduction extensively, weight gain is a complex and covert interplay between biology, psychology, and environment, and health professionals need to draw awareness and discussion to the biopsychosocial relationship. However, weight-related challenges are typically not seen from a multicausal perspective in general practice and many public guidelines (Brownell, 2010; Moffitt, Haynes, & Mohr, 2015). As a result, psychological factors, including underlying cognitive processes, are generally not receiving as much attention as pathways for tackling the growing obesity epidemic compared to environmental measures and lifestyle modification (BPS, 2011).

Psychological treatment of obesity

Research suggests that psychological interventions are more effective for sustained clinical efficacy in maintaining successful weight loss outcomes than only relying on lifestyle-based approaches. Thus, they should ideally be incorporated into a multi-component programme for maximum benefit (Shaw et al, 2009). With the cognitive role in the development and maintenance of excess weight currently being undermined, it is not surprising that standard health services in the UK currently do not address the role of cognitive and emotional factors sufficiently for weight management which is a missed opportunity. Several psychological consultation techniques have been suggested for addressing problematic thoughts and beliefs that can be barriers to weight loss. These are elaborated in the following sections.

● **Behavioural & Cognitive Behavioural therapies**

Behavioural therapies are the most commonly applied psychological therapies for weight loss. They have demonstrated superior effectiveness and maintenance of weight loss compared to other forms of therapies (Shaw et al, 2009; Burgess et al, 2017). Behavioural therapy recognises that all behaviours are learned, and unhelpful behaviours can be changed (Healthline, 2016). They adopt a combination of 1) a reduced calorie diet, 2) aerobic physical activity and 3) behavioural strategies to facilitate adherence to diet and activity recommendations, for example goal setting, self-monitoring behaviour and control of eating stimuli (Wadden et al, 2015; Pekkarinen, Takala, & Mustajoki, 1996). The suggested methods of action for behavioural therapy is the provision of adaptive dietary coping strategies that increase motivation for continued dietary restraint, particularly for managing lapses in diet and physical activities (Wing et al, 1996).

Cognitive behavioural therapy (CBT) describes a specific subtype of behavioural therapy that emerged in the mid-20th century originating from therapeutic approaches developed by Albert Ellis and Aaron T. Beck. In contrast to psychoanalytical techniques, CBT focusses on treating problems 'in the present' by focussing on identifying and modifying unhelpful thinking patterns and emotions (Wilson et al, 1999). Research supports the superiority of this intervention in the context of weight management in comparison to behavioural therapy when combined with dietary and physical activity measures (Cooper et al, 2001; Shaw et al, 2009), which highlights the importance of addressing thoughts and emotions for treating obesity instead of solely prompting weight loss behaviours.

- **Mindfulness-based interventions**

Mindfulness-based interventions that target eating habits have gained popularity in recent years as an avenue through which problematic eating behaviours can be modified by addressing difficult food-related thoughts and emotions. These have been extensively discussed as important contributors for problematic eating behaviours that predict weight gain (O'Reilly et al, 2014). Mindfulness describes a state of consciousness that is characterized by consciously attending to one's moment-by-moment experiences, thoughts, and emotions with an open, non-judgmental approach (Brown &

Ryan, 2008). By taking on an accepting stance for detaching from and interrupting distressing thoughts and emotions, this technique has been shown to promote awareness of bodily experiences related to physical hunger, satiety as well as emotional triggers for overeating (Daubenmier et al, 2011). Mindfulness-based interventions have been suggested as effective in tackling and reducing obsessive food-related thoughts, which is likely to be a result of accepting the presence of negative thoughts instead of suppressing or avoiding them. Therefore, this approach offers a promising gateway for addressing cognitive processes involved in weight gain, including restraint thinking and preoccupation (Alberts et al, 2010). A recent literature review supports the effectiveness of mindfulness techniques for improving maladaptive eating behaviours, especially for binge eating, emotional eating and eating in response to external cues. Multiple effective mindfulness techniques were identified in the context of obesity, including combined mindfulness and cognitive behavioural therapy, mindfulness-based stress reduction, acceptance-based therapies, mindful eating programmes, and variations of mindfulness exercises. Positive outcomes mainly refer to success in regulating food intake and weight loss. Consequently, mindfulness-based interventions represent a promising method to treat obesity, and could be widely provided for obese individuals who may benefit this form of intervention in the areas of prevention and treatment of excess weight (O'Reilly et al, 2014).

Furthermore, Acceptance and Commitment Therapy (ACT) is a specific subtype that has been successfully used to treat addictive behaviours such as drug abuse and smoking, and more recently in the context of tackling obesity. ACT employs mindfulness strategies to target experiential avoidance. Experiential avoidance refers to attempts to avoid or control certain private events such as negative emotions, thoughts or bodily sensations. According to ACT the aim is to bring about a willingness to accept difficult thoughts, emotions and sensations, rather than trying to avoid them (Hayes, Strosahl & Wilson, 1999). This technique helps individuals relate to their thoughts differently by enabling them to choose to act in accordance with their personal values and life goals. In the context of food-related cognitions this may help individuals refrain from bouts of overeating

and adhere to exercise and eating plans with evident effectiveness in regards to significant reductions of BMI and increases in physical activity in women who are attempting to lose weight (Tapper et al, 2009).

Mindfulness-based Cognitive Therapy (MBCT) is another specific and more comprehensive form in this intervention group that was originally designed for treating depressive symptoms (Ma & Teasdale, 2004). MBCT combines elements of CBT with a mindfulness-based approach by fostering decentred thinking where participants engage in daily mindfulness session to encouraged perceiving their thoughts as transient mental events rather than aspects of themselves. This particular method adopts the complimentary use with behavioural strategies that induce feelings of mastery and reduce activities associated with low mood. The main difference to other psychological treatments that target problematic eating is the absence of change strategies, such as problem-solving or cognitive restructuring (Baer, Fisher & Huss, 2005). Despite its scarce application to date MBCT has produced promising improvements in obesity-related behaviours by improving awareness and recognition of triggers and developing adaptive coping strategies instead of acting upon them (Baer, Fisher & Huss, 2005; Soleimaninanadegani, 2013).

● **Motivational Interviewing**

Motivational Interviewing is a directive person-centred approach designed to explore ambivalence and to activate motivation for change. (Miller & Rollnick, 1991). It recognises that individuals are faced with conflicting motivations, thoughts and pressures when they undertake behavioural changes required to produce desired outcomes. Most recently motivational interviewing techniques have been applied in combination with traditional weight loss programmes (e.g. Carels, Darby & Cacciapaglia, 2007; Navidan et al, 2011), or as a strand alone treatment (e.g. Meybodi et al, 2011; Davoli et al, 2013; Schwartz et al, 2007), and have achieved significant reductions in weight and successful re-engagement with an adjunct programme after individuals experienced difficulties (Careles, Darby & Cacciapaglia, 2007).

Overall, the range of available literature suggests that individual interventions have a relatively limited impact; therefore, comprehensive and holistic strategies involving multiple interventions to address different determinants of weight gain are necessary in this context (Sassi, 2010). For example, providing information on nutrition and promoting healthy lifestyle behaviours alone produces less significant outcomes than for combined methods that are tailored to people's emotional state and motivational stage.

Measures to prevent obesity

In sum, the discussed interventional approaches have been designed to treat excess body weight by focussing on the facilitation of weight loss. Despite obesity prevention being described as the most practical, cost-effective and promising way to combat the high prevalence of overweight and obesity among adults, to date there is limited research in the area (Hutchesson et al, 2015). Not only could prevention lead to significant economical savings through reduced utilisation of health services, but also, and mostimportantly, preserve people's health and quality of life by preventing or delaying a range of health conditions caused by excess weight. Reviews of preventive approaches and population-wide policies suggest that early initiatives aiming to curb the obesity epidemic can lead to bigger financial savings than costs to implement them, which provides support and justification from an economic point of view (e.g. Gorthmaker et al, 2015; Tran et al, 2014 & Moodie et al, 2013).

A review of existing preventive measures suggests that currently adopted behaviour change programmes are mainly are targeted at children and adolescents in school settings with the aim to address weight-related problems as early as possible. Commonly these programmes target lifestyle behaviours by combining healthy eating with physical activity. Evaluations have however concluded limited effectiveness in preventing weight gain, suggesting that only focussing on lifestyle behaviours may not be the appropriate method to facilitate maintenance of a healthy weight (Flodmark, Marcus & Britton, 2006; Kamath et al, 2008). Equally, an intervention that aimed to curb weight gain outside the school setting based on behaviour

theory and Social Cognitive Theory as proposed by Bandura (1986) only demonstrated modest results (Branscum & Sharma, 2012).

Several measures were adopted in the UK in the last few years as a response to the ever-growing national obesity problem, mainly focussing on promoting healthy eating and physical activity. A powerful example is The Change4Life campaign that was launched by the UK Health Department as a nationwide campaign in 2009 in response to the NICE guidelines published in 2006 as well as future predictions by the Foresight report from 2007. The objective was to engage British families in participating in healthier dietary choices, such as reducing sugar intake, and adopting more active lifestyles via multiple channels, including a mobile app, text messages, emails and Be Food Smart packs offering informational support based on evidence from interventions which focus on behaviour change. Although the campaign has been praised for their success in fostering a healthier lifestyle, there is no objective documentation of its effectiveness in reducing obesity rates (Government, 2010). Furthermore, several governmental policies were initiated over the last few years, including efforts to improve food labelling with the nationwide launch of a labelling system using colour codes to clarify the amount of fat, salt and sugar, as well as calories contained in groceries from the major retailers in the UK (Government UK, 2013). Despite evidence suggesting its effectiveness in encouraging the general population , regardless of their weight status, to make healthier food choices, the accurate implementation has been challenging: There are currently still no official guidelines detailing consistent placement and presentation resulting in significant inconsistencies, which can be confusing and misleading for consumers (Ducrot et al, 2016; Hieke & Harris, 2016). Other policies include the obligation of high street businesses to provide calorie information on their menus, as well as providing guidelines on physical activity for different age groups (Government UK, 2015).

In sum, despite an increasing uptake in health-promoting policies, there is very little evidence that these measures have resulted in any meaningful changes in tackling obesity by modifying food choices (Crino, Sacks & Wu, 2016). This means that slow weight gain could go unnoticed until significant health problems develop at a clinical level. Despite these findings that

indicate urgent need to intervene, there is scarce evidence of measures that are specifically designed for individuals with or without specific health risks prior their critical weight gain. Although a few clinical recommendations have been made, these are generally lacking theoretical and methodological underpinning and are more appropriate for individuals who are at an unhealthy weight already (Brauer et al, 2015).

4.7. Implications

To date, preventive and interventional measures to address the concerningly increasing obesity rates in the UK have demonstrated limited effectiveness. Existing research suggests that clinicians need to pay more attention the psychological processes that lead to behaviours associated with weight gain, in particular cognitive processes associated with a higher body weight (e.g., Byrne, 2002; Cooper & Fairburn, 2001). However, their role in the context of weight gain in individuals who are at risk of becoming overweight has not yet been investigated (Barnes et al, 2010).

A mixed method design was used to investigate the role of food-related thinking styles in people of different BMI categories, predominantly focussing on a comparison between individuals with a risk of becoming overweight, with a BMI of 23 to 24.99, to individuals with a weight defined as overweight and obese (BMI >25) to determine differences with potential to guide tailored interventions based on weight status. The quantitative design included the measurement of BMI, food thought suppression, food preoccupation and demographic variables, including age, gender, education and ethnicity. This survey was followed up with a self-designed qualitative telephone interview in a smaller sample.

Afro-Caribbean ethnicity was found to be a significant predictor for an increased BMI. Although not statistically relevant, a lower BMI was positively correlated to food thought frequency, negative valence of food and food thought suppression, while people with higher body weight were more likely to express a positive or a neutral valence of food.

Taking the present findings into account, the impact of food-related thinking styles on food choices and eating habits is substantial, which

indicates that they need to be urgently addressed in publicly available and accessible weight loss interventions. Based on a comparison between different weight categories, thought processes are particularly important in the context of preventive measures targeting groups at risk of weight gain, as these are likely to display difficult thoughts which have been linked to weight gain, such as ruminating, labelling foods, and diet-related concerns. Overall the emerging results indicate that preoccupation with food and food thought suppression are linked to a lower body weight, which implies that they may serve as coping mechanisms to maintain a lower body weight and to prevent weight gain, particularly in relation to the experience of frequent negative thoughts. This potential to curb weight gain as a result of these thinking styles needs to be treated with caution. Firstly, it may not be applicable to people with a weight above the healthy range. Moreover, having constant thoughts about food is likely to trigger negative, maladaptive thoughts and emotions, which was highlighted in both the quantitative and qualitative research, and therefore makes promoting food preoccupation questionable as effective measures to prevent weight gain or to initiate weight loss. Instead, a more appropriate way to address the evident link between low body weight and high thought frequency may be replacing the occurring negative with positive thoughts. This may encourage a heightened awareness of more conscious food choices, while simultaneously fostering a more positive approach to eating. For example, rather than demonising or banning foods, a more helpful, alternative thought may be to enjoy every food in moderation. This particular thinking style of positive reframing was identified as a helpful coping mechanism according to the present findings and aligns with existing literature. The benefits of positive thinking about healthy eating go beyond the psychological effects, as previous research suggests that it can predict higher diet quality (Aggarwal, 2014).

However, in general, weight differences do not appear to explain food-related thought patterns to the extent that was assumed prior to conducting the study based on literature findings. Instead, qualitative insights reveal that gender may be a greater predictor for the presence and extent of food-related thoughts, particularly in terms of rumination, categorical thinking and

preoccupation, with dieting being a potential moderator between both factors as this was strongly linked to being female. The high prevalence of restrictive diets in the sample is particularly concerning, considering that severe calorie restriction is detrimental for maintaining weight loss over a longer period of time. Moreover, dieting has been linked with high stress and maladaptive eating behaviour, which triggers binge eating and subsequent weight gain over time (Tomiyama et al. 2010; Goldschmidt et al, 2012). These previous findings demonstrate that restricting calories increase the output of cortisol, and that constant monitoring of calories increases stress levels. Dieting is likely to be maladaptive for individuals' psychological well-being and biological functioning, which makes calorie restriction a salient physical stressor. Therefore, biological consequence of stress may impact dieters' well-being and weight loss goals. Subsequently, chronic stress increases appetite, and the continuous restriction of calories further increases cortisol levels. This interrelated relationship perpetuates overall cortisol intake, making weight management efforts incredibly challenging.

In terms of practical implication of these findings, it can be concluded that more emphasis needs to be placed on positive and resource-oriented healthy eating approaches, rather than focusing on weight loss, for tackling overweight as this may assist people in maintaining healthier eating patterns over a longer period of time. This gap is reflected in a review of the current clinical landscape of available weight management approaches that follow predominantly a prescriptive approach. Although 3rd wave treatments are increasingly advocated as superior in their long-term effectiveness for managing overweight and preventing further weight gain, they are still not implemented as a standard route, despite their evident and compelling success rates by addressing cognitive and psychological relevant underlying factors involved in weight gain (BPS 2011; Bugress et al, 2017).
 Taking different weight groups into account, the general trend should be to a shift from the current predominant focus on dietary behaviours to strategies that reduce maladaptive thought patterns and difficult emotions occurring in the context of weight gain. Mindfulness-based interventions have been suggested as effective to address the nature of this challenge, particularly ACT, as this form of therapy has demonstrated success in treating difficult

food-related thoughts in the context of eating disorders (Slyter 2012), and is suggested as appropriate for people with a problematic relationship and history with food that involves chronic dieting, binge eating and body shape concerns (Lillis, Hayes & Levin, 2011). This is particularly interesting considering that the present study indicates a tendency in people who are at risk of overweight to suppress or avoid their thoughts to escape the negativity and distress they provoke, however accepting these thoughts may actually provide a more helpful coping strategy to deal with food cravings compared to food thought suppression based on previous research (Hooper et al, 2012).

Furthermore, promoting intuitive eating may be a promising additional gateway for women to help normalise the identified maladaptive and self-sabotaging eating patterns triggered by negative body image and dieting attempts, as dietary intake is based on internal cues of hunger and fullness, as well as body acceptance. In sum, such programmes have demonstrated improvements in dietary restraint, restrictive dieting, physical activity, body satisfaction, and drive for thinness. Clinical practice should favour the uptake of such programmes, rather than focussing on weight loss (Schaefer & Magnunson, 2014). Coupling behavioural approaches, such as Cognitive Behavioural Therapy, with acceptance-based methods is potentially a desirable practice in order to address both maladaptive thoughts and emotions which are important processes involved in weight gain and weight maintenance. This approach proposes applying behavioural problem-solving strategies in combination with mindfulness by integrating tools to modulate moods in order to enable a more adaptive reactivity to emotional distress. The method has already demonstrated promising outcomes in weight loss interventions (Cesa et al, 2013).

Moreover, there is need to explore food-related thoughts in regards to ethnical differences in more detail to determine meaningful differences that may add to explaining the link to a higher BMI which could be used to inform tailored interventions or preventive measures for this particular group. Considering the increased risk of people with Afro-Caribbean ethnicity for obesity and weight-related considerations, it seems plausible to increasingly pay attention to ethnic peculiarities in the design and

development of programmes that target weight management and obesity prevention. Previous interventions have aimed at tailoring programmes to the Afro-Caribbean population, although these are scarce: One trial conducted in a sample of sedentary African-American adults to promote exercise with ethnically tailored elements, including African-American counsellors and sites, and additional materials addressing socio-cultural concerns around lifestyle behaviours of African-Americans. However, outcomes demonstrate that adding a culturally tailored programme component did not result in improved outcomes compared to standard counselling (Newton & Perrie, 2004). Future research should look into identifying and defining cultural variables and linking them to relevant programme components and outcomes (Kong et al, 2015).

Moreover, the outcomes of the research imply that psychological and cognitive factors that influence people's motivation and decisions driving a change towards healthier eating habits differs widely, and is influenced by a range of individual factors, such as history with dieting, the emotional valence of food, personal values and drive for thinness to name a few. Upon reflection about the likely bias in the sample towards and increased interest in nutrition and health, for individuals who are unaware and disengaged of their change their problematic food-related behaviours, these factors may be entirely different again, and Motivational Interviewing may be a more appropriate approach to explore their resistance and ambivalence. For others, simply informing them about their weight status and resulting health consequences may be sufficient to trigger awareness for change. Considering the likely need for a personalised approach to weight management, a diagnostics tool may be a favourable route to help identify an appropriate intervention for each individual based on relevant factors impacting the likelihood to create successful outcomes in different method, such as readiness for change but also cultural variables or ethnicity, which have been identified as relevant contributors to weight gain in the present study. Future prospective studies should explore the development and feasibility of such a decision making tool, which could at some point be used in clinical practice to support healthcare professionals in their selection of appropriate intervention approaches tailored to identified individual needs.

4.8. Conclusions

The present study aimed to identify food-related thoughts as predictors for weight gain. While a quantitative analysis did not find any significant correlation between cognitive factors and weight, Afro-Caribbean ethnicity was associated with increased BMI. On the other hand, qualitative outcomes suggest people's high tendency to ruminate about food choices and common presence of an inner conflict between the pursuit of healthy eating and the temptation to indulge in overeating, which results in a strong tendency to categorise food as "good" and "bad". In this context, discussed coping strategies included trigger avoidance, positive imagining of future outcomes and adopting the rational approach "food is fuel". Clinical practice should consider increased uptake of 3rd wave approaches, such as ACT and CBT to address identified maladaptive thought patterns in the context of food as these are likely more effective than prescriptive lifestyle approaches. Future research should explore the development of a diagnostic tool to help clinicians make more informed decisions for suitable intervention approaches for individuals that can address relevant underlying thoughts and emotions, but also cultural variables such as ethnicity, for improved effectiveness and personalisation of weight management programmes.

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Appendices

1) Briefing presented at quantitative survey

Exploring food-related thoughts

RESEARCH CONDUCTED BY

HELENA WEHLING, DOCTORATE STUDENT IN HEALTH PSYCHOLOGY
AT LONDON METROPOLITAN UNIVERSITY

Thank you for your participation in this research project. You are invited to take part in a study that is about food-related thoughts in relation to weight, which will take approximately 90 minutes. Obesity has become a highly concerning health challenge in the UK (Sedghi, 2014) resulting in ever increasing economic burden (Consultancy UK, 2015). Therefore it is crucial to address risk factors associates with weight gain for effective prevention.

In the context of this project we will ask you to complete two questionnaires that include questions about how you think and feel towards food and how you are eating.

If you're interested to do an additional part of this research, this survey will followed by a telephone interview with the researcher, where these topics will be further explored in order to gain a deeper understanding. The interview will take around 30 minutes and will be scheduled separately by contacting you via email. During the overall assessment you may experience discomfort due to the sensitive nature of the personal information being asked. If the assessment rises a lot of negative thoughts or feelings in you and you wish to speak with a professional, the researcher can provide you with information on who you can contact for this and how.

The participation is voluntary and you are free to withdraw at any time during data collection, and you may request to withdraw your data up to two weeks after the date of collection without giving a reason. In this case your data will be destroyed upon such request if made within the time limit. You won't be penalized in any way, nor be questioned why you wish to do so. The records of this study will be kept confidential. In any sort of report we make public we will not include any information that will make it possible to identify you. Your name won't appear on any of the material that contain your data, and an assigned ID number will be used to identify the transcripts. Research records will be kept in a locked file; only the researchers will have access to the records. The interview will be tape-recorded, and we will retain the collected material for 10 years. Once this time period has passed, all your data will be destroyed.

The aim of the study is to explore food-related thoughts that are associated with particular weight categories in order to determine their role in initial weight gain. Findings could contribute to forming a novel and effective approach for preventing weight gain and associated health complications.

If you experience discomfort or negative feelings participating, you may call the investigator Helena Wehling at ███████████████ or ██████████ ██████████ (44) 020-7133-2782. If you wish to learn the outcome of this study, or if you have any questions, please contact the investigator (details below).

Thank you, your participation is very much appreciated.

Helena Wehling   ████████████████
████████████████████

2) Consent form presented in online survey

This project has been approved by the Psychology Ethics Committee at London Metropolitan University. You have the opportunity to ask, and have answered, any questions you may have about this research at any point during the study. If you have such questions, you may call or email Helena Wehling at (44) 07 834 671 232 or helena.wehling@gmail.com . If you want to speak to her supervisor, you may contact ~~Dr.~~ Lusher, Leader of the Doctorate Health Psychology Programme at London Metropolitan University at (44) 020-7133-2782 or

Further information, along with relevant research ethics materials and advice, can be found on the Research & Postgraduate Office Research Ethics webpage:

http://www.londonmet.ac.uk/research/the-research-and-postgraduate-office/current-students/research-ethics.cfm

or in the Code of Human Research Ethics approved by the British Psychological Society (BPS):

http://www.bps.org.uk/sites/default/files/documents/code_of_human_research_ethics.pdf

* Consent:

☐ I have read and understood the information on this page. My questions have been answered to my satisfaction and hereby I voluntarily agree to participate in this study. I understand that I will receive a consent debriefing form at the conclusion of my participation.

☐ I certify that I am at least 18 years of age.

* The researcher may contact me via email for an additional telephone interview, which will approximately take 30 minutes.

◯ No

◯ Yes - Email address:

* I would like to get a brief summary with my results via email.

○ No

○ Yes - Email address:

[   ]

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3) Food Preoccupation Questionnaire (FPQ)

* Please rate the extent to which you agree or disagree with the following statements, by placing a tick in the appropriate box. Some of the questions may look as if they are 'opposite' to one another. However, **please don't worry about being consistent in your responses**. It is often the case that we feel one way in some situations but a completely different way in other situations. As such, you should answer each question as if it were the only question and avoid looking back at your previous answers.

	1 Completely disagree	2 Disagree a bit	3 Neither agree nor disagree	4 Agree a bit	5 Completely agree
1 I spend a lot of time thinking about food	○	○	○	○	○
2 Planning meals can be quite stressful	○	○	○	○	○
3 I often find myself thinking about food	○	○	○	○	○
4 My thoughts about food don't tend to me particularly pleasant or unpleasant	○	○	○	○	○
5 I really enjoy myself thinking about food	○	○	○	○	○
6 I can get quite stressed if I start to think about food	○	○	○	○	○
7 I often struggle with thoughts about food	○	○	○	○	○
8 I like thinking about my favourite food	○	○	○	○	○
9 When I think about food it's not usually linked to any particular emotion	○	○	○	○	○
10 I often look forward to my next meal	○	○	○	○	○
11 I hate being distracted with thoughts about food	○	○	○	○	○
12 I don't particularly enjoy or dislike thinking about food	○	○	○	○	○
13 I worry I spend too much time thinking about food	○	○	○	○	○
14 I love thinking about food	○	○	○	○	○

15 Thinking about food can put me in a bad mood	○	○	○	○	○
16 Sometimes I think about food just for the fun of it	○	○	○	○	○
17 I don't think about food all that much	○	○	○	○	○
18 Deciding what to eat can be quite stressful	○	○	○	○	○
19 I can get really excited thinking about food	○	○	○	○	○
20 I don't pay much attention to thoughts about food	○	○	○	○	○
21 Thinking about food can put me in a good mood	○	○	○	○	○
22 I hate thinking about food	○	○	○	○	○
23 Thinking about food doesn't really excite or depress me	○	○	○	○	○
24 I enjoy deciding what to eat in a restaurant	○	○	○	○	○
25 Thinking about food can make me quite miserable	○	○	○	○	○
26 I enjoy planning what I'm going to eat	○	○	○	○	○

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Food Thought Suppression Inventory:

* Please indicate your response by selecting the number that best represents your experience.

	Strongly Disagree 1	2	3	4	Strongly Agree 5
1. There are foods I prefer not to think about.	○	○	○	○	○
2. Sometimes I wonder why I have the thoughts about food that I do.	○	○	○	○	○
3. I have thoughts about food that I cannot stop.	○	○	○	○	○
4. There are images about food that come to mind that I cannot erase.	○	○	○	○	○
5. My thoughts frequently return to one idea about food.	○	○	○	○	○
6. I wish I could stop thinking of certain foods.	○	○	○	○	○
7. Sometimes my mind races so fast about food I wish I could stop it.	○	○	○	○	○
8. I always try to put eating problems out of my mind.	○	○	○	○	○
9. There are thoughts about food that keep jumping into my head.	○	○	○	○	○
10. Sometimes I stay busy just to keep thoughts of food from intruding on my mind.	○	○	○	○	○
11. There are foods that I try not to think about.	○	○	○	○	○
12. Sometimes I really wish I could stop thinking about food.	○	○	○	○	○
13. I often do things to distract myself from my thoughts of food.	○	○	○	○	○
14. I have thoughts about food that I try to avoid.	○	○	○	○	○
15. There are many thoughts about food that I have that I don't tell anyone.	○	○	○	○	○

Demographic questionnaire:

You've nearly come to the end of this survey, there are only a few more things I'd like to know about you.

* 1. Please indicate your gender:

○ Male

○ Female

* 2. What is your date of birth?

Day:

Month:

Year:

* 3. What is your current weight in kg?

* 4. What is your height in cm?

* 5. What is your ethnic group?

○ White

○ Mixed/multiple ethnic groups

○ Asian/Asian British

○ Black/African Caribbean/ Black British

○ Other (please specify)

* 6. What is the highest level of education you have completed?

○ Higher education & professional /vocational equivalents

○ Alevels, vocational level 3 and equivalents

○ GCSE/O Level grade A*-C, vocational level and equivalents

○ Qualifications at level 1 and below

○ No qualifications

4.) Debrief sheet

Participant Debriefing Form

Topic of Research Project: Exploring food-related thoughts associated with weight

Thank you for participating in our study. Your views are extremely valuable, as they will help the researcher to develop deeper understanding of food-related thoughts, in particular to what extent and how they differ between weight categories.

The nature of thoughts and their impact on their relationship with food we intend to explore are food thought control, restraint and dichotomous thinking, as well as identifying new relevant constructs via more detailed interviews that serve gaining more meaningful and individual insights.

Investigating factors that are associated with a certain weight are important to consolidate knowledge about drivers for weight gain, which can contribute to generating improved understanding of effective methods for early prevention of weight gain, and therefore inform interventions that tackle the obesity crisis.

If you wish to find out more about this study or wish to be referred to online support resources, please email the investigator ▬▬▬▬▬▬▬▬▬▬ or her University research supervisor ▬▬▬▬▬▬▬ .

If you have experienced discomfort during the process of the study, and think you may have a problem that is linked to your relationship or thinking around food or your weight, you can refer to the following links for support:

https://b-eat.co.uk/

http://www.nhs.uk/conditions/eating-disorders/pages/introduction.aspx

http://www.nhs.uk/Conditions/Obesity/Pages/Treatment.aspx

Thank you for your time.

5.) Qualitative interview: Information sheet & Consent form

Information Sheet

Research exploring food-related thoughts.

Dear participant,

Thank you very much for taking part in the online survey with the topic "Exploring food-related thoughts". Your responses are very helpful for me in progressing in my research on this topic. You have indicated that I may contact you via email again regarding a qualitative follow-up interview.

Similar to the online survey, this interview aims to understand how different weight categories may be associated with the relationship around food, in particular concerning beliefs and thoughts.

This research is being conducted in the context of a doctoral dissertation in Health Psychology at London Metropolitan University.

Participating in this research involves being interviewed over the telephone by a researcher and it is anticipated that the interview will last approximately 30-40 minutes. The interview will be conducted in English.

During this interview you will be asked questions that relate to your personal relationship with food and thoughts or feelings you may have around eating. The interview will be recorded and subsequently transcribed to help us analyse the discussion. All the information collected will be kept confidential and will not be passed onto. The research complies with the Psychology Ethics Committee at London Metropolitan University. The doctoral student will analyse interviews from a range of participants and produce a thesis with the insights. You will not be identifiable in this research report.

Your participation in this research will be completely voluntary, you will have the right to withdraw your participation at any time and to withhold any information you do not wish to share.
If you are interested in taking part, please respond to my email, so we can arrange a date that fits you. As mentioned, the interviews will be conducted via the phone so you can do them from home comfortably. If have any questions, please do not hesitate to contact me, either on this email or on 07834671232.

Consent Form

Please read the statements below and sign to confirm that you have read and

understood the information provided.

- ▪ I confirm that I have read and understand the information sheet provided for the above research and have had the opportunity to ask questions.
- ▪ I understand that my participation in this research is voluntary and that I am free to withdraw at any time, without giving any reason.
- ▪ I understand that this research will comply with the Data Protection Act and the guidelines from the Psychology Ethics Committee at London Metropolitan University.
- ▪ I understand that this interview will be audio recorded for analysis.
- ▪ I understand that this research is conducted in the context of a non-funded independent doctoral thesis, which relies on voluntary participation without reimbursement.
- ▪ I understand that the researcher will analyse and aggregate my personal data and send this analysis without any identifiable data.
- ▪ I agree to participate in this research interview.

_____ _____   _____

Name of Participant   Date   Signature

Competence 3.1.
Systematic Review

People with a BMI $\geq$ 30 under-report their dietary intake. A systematic review.

Contents

Abstract

Under-reporting of total energy-intake (EI) is a common and well-known source of measurement error in dietary assessment. Although evidence suggests that underestimation of calorie intake is common across the general population, studies increasingly highlight that this bias occurs to a significantly larger extent in people with a higher weight, especially among people who have an obese BMI. This can illustrate a problem in clinical practice when dietary data need to be evaluated during dietary interventions, as practitioners are unable to get access to their patients' actual eating behaviours. The three most common and most widely applied methods to determine dietary data via self-report include the dietary recall, diet history questionnaires and diet records.

The aim of the present literature review was to summarise and assess the evidence of the reliability of self-reported dietary intake in people with a Body Mass Index (BMI) that lies within the obese weight category ($\geq$30). To date there is no systematic review that focusses on this particular population, or considers a wide range of reporting techniques. The included papers were gathered from established databases, including PsycINFO, CINAHL, MEDLINE and Web of Science. A total of 3,475 were identified, out of which 34 were selected for this review in multiple stages. Across all included studies it was found that there is a clear association between a BMI $\geq$ 30 and lack of reporting accuracy of dietary intake with a strong tendency for under-reporting. This was confirmed by significant higher under-reporting rates in comparison to other weight categories. Therefore, information on food intake obtained from self-reported data need to be particularly treated with caution in obese population, and further research should look into exploring and validating techniques to reduce this bias in clinical practice.

1. Introduction

1.1.Background

Over the past decade obesity has become one of society's major health challenges (Royal College of Physicians, 2013; Morris et al, 2014), illustrating an increasing burden on the health system (Selassie et al, 2011). Statistics demonstrate that currently approximately 67% of men and 57% of women in the UK are either overweight or obese, according to the categories defined by the WHO that classify an overweight BMI over 25, and an obese BMI over 30 (Sedghi, 2014). Further trends show that by 2030 there could be as many as 65 million more adults in the USA, and 11 million more obese adults in the UK (Wang et al, 2011). According to recently published research by McKinsey & Company (2014), every year obesity costs the world $2 trillion in economic burden, through both direct medical cost and indirect cost of decreased productivity. Falling slightly behind smoking, obesity brings along a burden of $73 billion, or around 3% of the gross domestic product (GDP) in the UK (Consultancy UK, 2015). Taking these figures into account, obesity is a highly concerning issue in today's society that calls for urgent and impacting action.

It is plausible that obesity must result from energy imbalance, and it has long been assumed that simple excess intake of kilocalories leads to overweight. However, this has not been demonstrated in the literature; a range of studies have shown that obese persons have repeatedly and consistently reported consuming the same or less energy than their normal weight counterparts (Myers et al., 1988; Lincoln et al., 1972).This is also reflected in clinical practice: Dieticians frequently see morbidly obese patients who find it difficult to lose weight and who have a suspected underlying medical cause, however the reason for their failure to lose weight often cannot be explained by metabolic imbalances (Buhl et al., 1995). This

suggest that there may be a general gap observed between the energy intake that obese individuals report and the amount of food intake required to maintain their high body weight as their reported consumed calories fail to account for maintaining or increasing their weight.

The difficulty in fully understanding the total energy intake people consume is that capturing food intake relies on self-reported data, and accuracy can be affected in a range of measurement tools used (Scaglusi et al., 2008; Black et al., 2001). The main limitation of food records is the under-reporting or misreporting of energy intake, as well as lacking representativeness of the overall diet, both under and over (Livingstone et al., 1990; Poslusna et al., 2009). This conclusion can be drawn from studies that have studied a range of groups, including children and adolescents (Livingstone et al., 1992), adults (Livingstone et al., 1990), athletes (Westerterp et al, 1986) and obese individuals (Prentice et al., 1986). The prevalence of under-reporting in the general population ranges from 18 to 54% but it can be as high as 70% for particular subgroups (Macdiarmid et al., 1998). Although nearly all people tend to underestimate their calorie intake, there is increasing evidence highlighting that the bias is even worse in people with a higher BMI (Lichtman et al., 1992; Livingstone et al., 2003; Tooze et al., 2004). Assessing the accuracy of self-reports about energy intake in the obese therefore is important, as measurement error can conceal effects of food and nutrient intake on health outcomes (Thompson et al., 2008).

Adding to the understanding to why reporting accuracy is a particular problem for people with a high body weight, clinicians and researchers have proposed a wide range of possible reasons. In regards to energy intake, it has been suggested that underestimation of the increasing sizes of restaurant and home-cooked meals is contributing to the rising obesity rates (Nielsen et al, 2003; Young et al., 2003). On the other hand, in clinical treatments of obese persons, it is commonly assumed that they intentionally underestimate food intake to improve their self-esteem as a form of self-deception or self-presentation, because they want to present themselves in a positive light to others (Muhlheim et al., 1998). Macdiarmid et al. (1998) identified different

types of under-reporting, taking into account the motivational background. These can be summarised as:

1. Food being eating but deliberately NOT reported (intentional under-reporting);
2. Food consumption being reduced, or certain foods being avoided, during the period of study (intentional alteration of diet);
3. Food being eaten but genuinely forgotten (unintentional/ unknowing under-reporting).

Consequently, the intention of under-report needs to be distinguished when identifying underlying factors, and people who report unintentionally need to be treated differently from people who provide false data on purpose, as they may have differing reasons for their behaviour, for example difficulty in recalling consumed food items for unintentional inaccuracy vs. self-presentation for intentional deception.

Previous research has been successful in identifying certain risk groups who are generally more likely to under- or misreport. According to a literature review that evaluated the accuracy of dietary self-report, it becomes evident that the most consistent differences exist between men and women and between groups of different body mass indices (Macdiarmid et al., 1998). However, according to several studies adiposity alone is not a sufficient variable in explaining under-report. Other suggested drivers with significant contribution include poor body image and weight consciousness. Hetimann (1993), Crawley & Summerbell (1997) and Lafay (1997) suggest that inaccurate reports of food consumption appear to be associated with dieting and dietary restraint, which could explain the strong link between under-report and an obese BMI to an extent.

1.2. Self-report methods for dietary intake

In order to evaluate the quality of dietary reports, it is important to understand and differentiate the various methods that are commonly used in clinical practice and research in regards to their methodological quality and limitations. The available tools identified can be divided into three general categories, including (1) recall of foods eaten, (2) diet histories or

retrospective questionnaires, and (3) diet records. Diet recalls aim to assess recent energy intake quantitatively and usually involve remembering all foods that have been consumed during the previous 24 h (Morgan et al., 1978). A frequently reported bias with this method is the lack of representativeness, as it may not adequately report eating behaviour on a habitual level, which is often the focus of diet-related studies. On the other hand, diet histories and food-frequency questionnaires have been associated with more accurate estimates of habitual dietary patterns within this population, however this method involves other problems, such as recall errors and seasonality of particular foods (Hill et al., 2001). Diet records require participants to weigh or quantify the total foods and drinks consumed over a period usually ranging from 3 to 7 days, typically by using household measures. (Gibson, 1990; Barrett-Connor, 1991). The extended timeframe involved in this technique may present a burden because it involves the precise and time-consuming documentation of energy intake over several days and therefore can result in poor reporting compliance. Moreover, eating behaviours during the recording period may be influenced, as individuals are aware that they are being observed. This may encourage consuming less energy than the person would typically eat (Barrett-Connor, 1991; Black et al., 1993). A potential bias with food-frequency questionnaires is the potential impact of social desirability, where foods perceived as 'good' are over-reported, whilst foods perceived as 'bad' are under-reported.

Overall, there are viable and valid methods available to measure self-reported energy intake, however these need to be treated with caution in regards to potential bias, for example social desirability or memory inaccuracy.

1.3. Methods for assessing accuracy of dietary self-report

Accurate energy intake assessment requires objective measures in addition to the self-reporting method in order to assess whether they are able to measure precisely within the particular population. There are several methods that can be used to assess the accuracy of self-reported data of dietary intake, but the ones that are most commonly used across the literature

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are Goldberg cut-offs and the doubly labelled water (DLW) method. Both methods are based on the fundamental principle of energy metabolism which states EE (energy expenditure) and EI (energy intake) are equal conditions of stable body weight and composition (Schoeller et al., 1990). EI may be defined as the energy content of the food consumed in a daily diet that is subsequently available for the metabolism, and EE is the mechanical work the body performs, including released heat to sustain surviving and lifestyle, such as walking or cognitive functioning. As a result of this energy balance principle, the energy requirements of different populations can be calculated based on average EI or EE, depending on specific characteristics of this group, such as lifestyle and genetic build-up (Hills et al., 2001). Basiotis et al. (1987) suggest using a 'precise' estimate of EI, which should be within 10% of the true intake of the group 95% of the time to be precise. Based on this definition, cut-off values were developed by Goldberg and his colleagues in 1990. The underlying principle was test the agreement between PAL (physical activity level) and reported energy intake in relation to BMR (basic metabolic rate). The purpose of using a cut-off is to improve the sensitivity and specificity for identifying under-reporters. The problem with Goldberg cut-off values is that they fail to take individual physical activity levels into account, which are known to vary greatly between people and contribute significantly to total energy expenditure. This observation has been concluded from studies investigating many different groups (Livingstone et al., 1992; Livingstone et al., 1990; Westerterp et al., 1986). Therefore, the degree of under-report assessed through the Goldberg method may be underestimated (Hills et al., 2001). Another limitation of using cut-offs is that they define under-reporting as an extreme, rather than on a continuum, and hence insufficiently account for measurement errors. Therefore, using the percentage difference between reported EI and EE is a valid method to determine the extent of inaccuracy (McCrory et al., 2002).

Since its development in the 1980s studies comparing self-reported EI with EE have increasingly used the DLW technique. The DLW technique for measuring total energy expenditure (TEE) involves enriching the water inside the body with the use of water labelled with a stable isotope of hydrogen and a stable isotope of oxygen. The difference in the extent to

which these isotopes are excreted from the body is a measure of the amount of carbon dioxide produced over that period of time from which the oxygen consumption and hence energy expended over the same time period can be computed. The DLW technique is an important technological advance that is generally considered the gold standard for the estimation of TEE (Shetty, 2001). Despite its viability and recommended use (Schoeller et al., 1990), however it is associated with significantly higher costs than the alternatives which may limit its use. Taking everything into account, it can be concluded that although dietary assessment all have their own advantages and limitations, they are all prone to misreporting.

1.4.Rationale for review

Existing literature consistently highlights the problem of under-report with dietary intake in obese people, making it a fundamental challenge for nutritional research when understanding the extent and underlying causes of this issue in more detail, including *who* is more likely to under-report, why they underreport and what they underreport. It is known that body size unlikely is the only contributing factor to explaining errors in energy report, but other factors such as gender, restraint eating and meal size can account for reporting accuracy as well (Wansik et al., 2006; Vansant et al., 2006; Macdiarmid et al., 2006). Identifying the existing evidence-based literature that focusses on obese samples can help to shed more light onto this potentially complex relationship, and furthermore help in identifying ways to improve accuracy that can be applied for healthcare professionals, for example dieticians, who work with obese patients.

According to an extensive database search in Cochrane Library, PSYCInfo and Google Scholar there is currently no systematic review that specially focusses on self-report accuracy of food intake in the obese population. Macdiarmid et al. (1998) have published a review that assessed drivers of under-report by identifying influencing factors in the general population. Although this research includes a chapter on obesity, it needs to be highlighted that substantially more studies addressing this topic exist nowadays, considering that the review was conducted nearly twenty years ago. Moreover, this review was not carried out in a systematic way, therefore

it neither can be concluded that all existing evidence was reviewed, nor that the quality of the papers was scientifically ensured. Another literature review provides an overview of the validity of self-reported energy intake using the doubly labelled water technique (Hills et al. 2001). Again, this review isn't systematic, and does not focus on obese people. Moreover, it is restricted to accuracy assessment that use a specific method for the analysis.

Considering the evident tendency of people with increasing weight to underreport to a higher extent than others, there is scope to explore the overall impact of an obese bodyweight on reporting accuracy, which has not been done systematically to date. The systematic review should focus on all existing studies carried out within obese samples across a wide range of dietary self-report instruments and populations with different demographic characteristics, such as age, ethnicity and gender, which could be important to identify particular circumstances may affect accuracy, as well as whether particular subgroups in the higher weight range are at a particular risk.

1.5. Aims & Objectives

The purpose of the current review was, therefore, to examine the accuracy of self-reporting energy intake in people with a BMI ≥30. This work could furthermore provide details about factors which are associated with the extent of underreporting in this population, such as demographic factors (e.g. age, social class and gender), psychosocial influences (e.g. social desirability, extraversion or disinhibition), or clinical abnormalities (e.g. depression and binge eating disorders). This will afford the opportunity to identify specific risk groups within this BMI category who are more likely to under-report and therefore require particular attention when evaluating their data of self-reported food intake. The results of this review may potentially be used to highlight:

- The overall tendency or extent of under-reporting food intake across obese samples in comparison to non-obese samples
- Identification of valid or non-valid methods for self-reporting energy intake for people with an obese BMI
- Factors associated with under-report and accurate report in obese samples

- Recommendations about improving accuracy in self-report for this population
- Areas where further research may be required.

2. Methods

2.1. Literature search and selection

A search of the literature was conducted via the following databases: PsychINFO, MEDLINE, CINAHL and Web of Science. A broad search strategy was adopted to capture each self-report method for food-intake within the target population (Figure 1). Consequently, the reference lists of relevant articles identified through the database search and existing systematic reviews were searched manually to identify additional relevant studies.

The search was limited to articles published from January 1, 1982 to March 18, 2016. The reason for limiting the search to articles published after January 1982 was that a previous literature review identified that prior to this date it still was not possible to determine the validity of dietary assessment procedures, until the first objective method, the doubly labelled water (DLW) technique, was developed (Schoeller & van Santen, 1982; Coward et al., 1985). Furthermore, any studies that include a substantial number of participants younger than 18 years were excluded. A previous review has highlighted that dietary assessment among children is difficult because they are more susceptible to environmental influences than adults. Research indicates that children's self-report indicates considerable errors, which can be categorised as attention, perception, organisation, retention, retrieval and response. All of these factors can affect cognitive processing of food-related information, which is required for accurate recall and organisation of energy intake (Baranowski et al., 1994). This means that we can conclude a systematic difference in recall capacity between adults and children, which can cause bias when interpreting the results.

The search included the following terms, which were specified by finding synonyms using the Thesaurus function on EBSCOHost to capture as many applicable studies as possible.

("food intake" or "calorie intake" or diet* or "energy intake"

or "food consumption")

AND

high or ≥ 30) and (bmi or "body mass index") and obes*

AND

Record* or diar* or assess* or measure* or report* or estimate*

AND

reliabl* or accura* or valid* or estimat* or overestimat* or underestimat*
or under-report* or correct*

AND

"food intake" or "calorie intake" or diet* or "energy intake"

The search through PsychINFO, MEDLINE and CINAHL was run on the server EBSCOHost, and on the Web of Science in two separate searches. The search strategy included four thematic buckets, and the process consisted of multiple steps. Initially, all buckets were entered into the search bar individually and subsequently combined to guarantee that all terms were combined appropriately. All databanks included in the search produced a total of 3,475 papers, excluding duplicates. Next, the eligible titles and abstracts were screened simultaneously, as in many cases the title itself didn't provide sufficient information for the selection. The number of records that were excluded resulted in 3,444 as the focus of some of the studies was not found to be relevant for the topic of interest. After the full texts for the remaining 44 papers were retrieved, these were studied extensively and assessed for eligibility. It was concluded that 11 studies did not meet the full inclusion criteria due to different reasons. One paper failed to report accuracy of the dietary reports, while in two papers under-report remained unaddressed. However, the main reason for exclusion was a BMI < 30 (n=8). After screening the reference lists of identified studies one

additional eligible paper was included, which means that the total number of included papers resulted in 34 (Figure 1, p. 140). The final list of included paper was then confirmed by a second independent reviewer (JL).
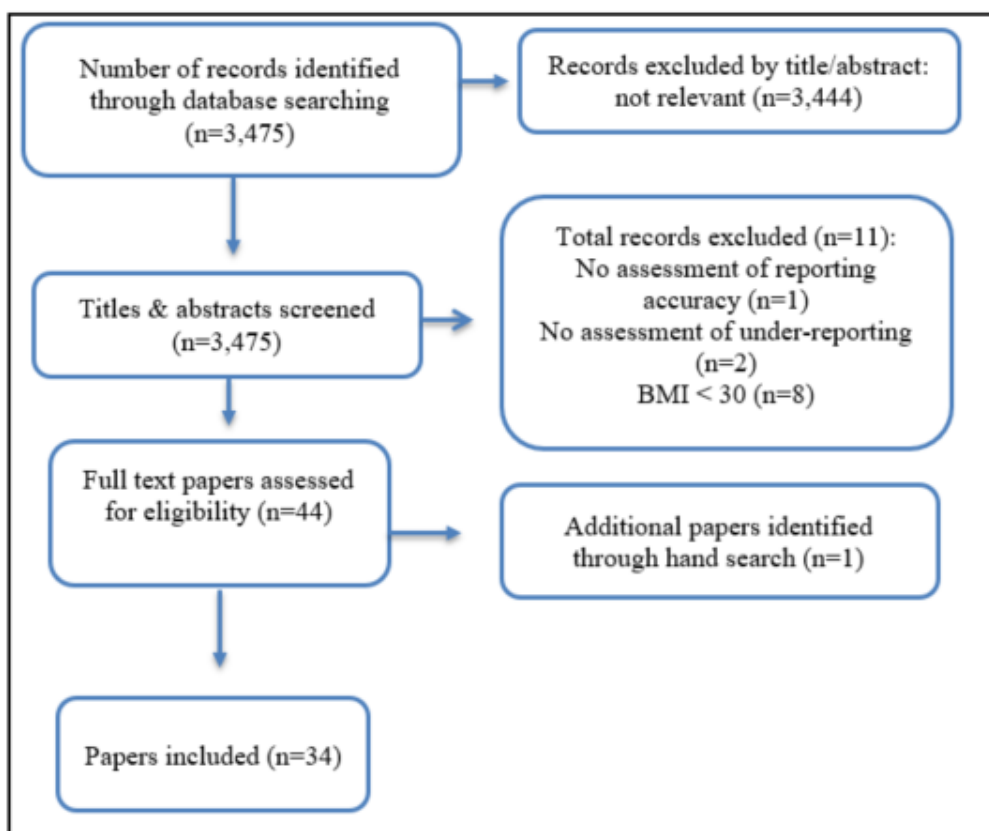
Figure 1: Selection process

2.2. Inclusion & Exclusion criteria

Studies were eligible for inclusion in the review if they met all the following criteria:

- Published between January 1, 1982 and March 18, 2016
- Written in English language
- Energy intake is measured via self-report
- Primarily based on adult samples (≥18 years)
- Participants with obese BMI (>30) are explicitly represented in the reported data

2.3. Quality of studies reviewed

The quality of the studies was reviewed using the Cochrane Handbook's general guidance on non-experimental studies to inform the choice of quality indicators (2 indicating higher quality than 1). The reason for choosing this particular method is based on the nature of the studies that were included in the reviewing process. Considering the interest of the research question was to identify the relationship between two variables, including reporting accuracy and obesity rather than the effect of manipulated independent variables, the studies included in this review were not of experimental, but rather observational nature. Therefore, this method seemed suitable as its criteria are tailored to the characteristics of this type of study. The examination criteria included: *sampling*: non-random = 1, random = 2; *representativeness*: response rates: <60% = 1, 60% or more = 2; *population definition*: selected sample (e.g. school students) = 1; general population = 2 and *sample size*: <100 LB or GB people = 1, >100 LB or GB people = 2. If any of the required details weren't provided sufficiently, the underlying criteria was assumed as being 'not described', as this reflects poor reporting quality of elements in the study, rather than poor quality of the study.

To summarise the total quality score for each study, the score for all four categories were determined and added up their total. The sum score was converted into the percentage numbers as a global indicator. The following list provides guidance on how each possible score has been converted:

(1) 1 out of 8 = 12.5%

(2) 2 out of 8 = 25%

(3) 3 out of 8 = 37.5%

(4) 4 out of 8 = 50%

(5) 5 out of 8 = 62.5%

(6) 6 out of 8 = 75%

(7) 7 out of 8 = 87.5%

(8) 8 out of 8 = 100%

After reviewing every individual study in regards to their methodological quality, the selected articles were collated; their results are summarised in Table 1 (p. 143).

3. Results

A total of 34 studies met the inclusion criteria and were included in the review. A summary of the characteristics of the studies and the factors examined in each study are shown in Table 1 (p. 146). All studies were carried out between 1982 and 2014. The majority of studies (79.5%) were based on samples from Europe ($n = 16$, 47.1%) or North America ($n = 11$, 32.4%). The sample size varied considerably across the studies, ranging from 9 to 23,289. From the papers identified, one sample was recruited in a nutritional study as a convenience subsample, several samples were part of a weight loss treatment at the time of data collection (n=5), while a different sample formed part of a clinical trial. Regarding the methodological design, a substantial proportion of the studies had a cross-sectional design (n= 25, 73.5%), including one observational study. The remaining designs included two case-control studies, two longitudinal studies, three case-control studies, two cohort studies, including one with a prospective design, one residential study and one covert study. While not all studies provided specific information about the number of obese participants, the sample sizes for this weight category, if they were included, ranged from 9 to 155. In total, two samples consisted exclusively of obese participants. To summarise the demographic characteristics, most studies represent both genders (70.6%), while the remaining focus on women. Two studies focussed on an older age group (>65 & 70-80 years), and another one included a middle-aged population. For assessing self-reported energy intake, the methods that were most commonly used in the present studies included diet records ranging from 3 to 9 days (n = 13), the 24 hour recall (n = 12) and the Food Frequency Questionnaire (FFQ, n= 9). Four studies utilised food diaries varying between 3 and 7 days, and three samples were asked to complete the dietary history questionnaire. While nearly all studies aimed to measure the overall energy take of participants, one study focussed on salt intake exclusively (De Keyzer et al., 2015), and another one paid particular attention to self-reports of protein, while still including all dietary sources in the analysis (Mossavar-Rahmani et al., 2013).

Table 1: Summary of findings

Author	Participants	EI method	SR accuracy	Main findings	Quality assessment
Abbott et al., 2008 (USA)	N=155 OB (BMI: x=31), middle-aged	3d diet records	Goldberg cut-off (EI:BMR <1.36)	46% UR (~401.6kcl/day) Factors for UR: years of education (p=0.001), less realistic weight loss goals (p=0.02), higher perceived exercise competence (p=0.07), social support for exercise (p=0.04), body-shape concerns (p=0.01)	63%
Bartholome et al., 2013 (USA)	N=15 with BED; n=17 non-BED F, OW & OB (BMI= 27 - 35) Age: x=30.1 ± 6.7	24-hrs dietary recall interview	Correlation between recall & laboratory meals	Reporting of actual intake: 90% in BED, 98% in non-BED (P=0.086) Factors for UR in BED: subjective loss of control, increased EI during BED episodes, less awareness of EI	63%
Cook et al., 2000 (UK)	N=1632 (n=539 F; n=558 M) Age > 65 yrs; includes L	4d food diaries	Goldberg cut off (EI:BMR< 1.35) with LERs below 1.2 times estimated BMR	LERs have signficantly higher BMI than non-LERs in both genders (27.5 vs. 25.7 in M, 27.99 vs. 25.4 in F) UR significantly higher in F (48% vs. 29% in M) Obesity is highest predictor (p<0.01), no other factors predict UR in F, in M social class and home ownership are additional factors	100%
De Keyzer et al., 2015 (Belgium, Norway, Czech Republic)	N=365 (healthy adults, convenience subsample of European Food Consumption validation study) Age: 45-65 yrs BMI: x=24.8 - 27.8 OB: n=87	Questionnaire on salt use Dietary recalls using EPIC soft;	Geometric means	Overall, AR for Na intake was highest among NW participants, however OB women from Norway & Belgium had higher accuracy than OW & NW in these countries As Na$^+$ density in diet increases, SR accuracy decreases	87.5 %
Emond et al., 2014 (USA)	N= 250 (OW/OB: 51.2%; African-American: 49.2%; 34.4% M)	Web-based 24-hr dietary recall assessment	Reported total caloric intake within 25% of total EE per DLW	Participants who under-reported their total energy intake were more likely to be overweight/obese (61.8%) compared to those who over-reported their total energy intake (37.8%; p=0.032).	75%
Fereidoun Azizi et al., 2005 (Iran)	N= 947 (OB= 23; 12 M and 23 F); BMI= 24.8 ± 4.4 in M; 25.9 ± 5.4) in F Age= 37.3 ± 14.6 in M; 32.9 ± 13.6 in F	24-hr recalls	Goldberg cut-off (EI: BMR <1.35)	Older age, higher BMI (P<0.01), female gender (p<0.001), but not educational level, is associated with UR	87.5 %

Garriguet et al., 2008 (Canada)	N=16,190	24-hr recalls	EI:EE (ration of true reporters 0.7– 1.42)	Obese subjects were accurate reporters (EI:EE 0.79). UR % in OB subjects (30.3%) not significantly different from NW (31.1%) and OW (37.8%) subjects	87.5%
Gemming et al., 2014 (New Zealand)	N=3919 (n=1715 M; 2204 F) OB: n=807 F; n=595 M Age: x=44.3 ± 0.28 M; x=45.3 ± 0.25 F	Three pass 24-hr dietary recall (computer-based and interviewer-assisted)	EI : RMR_{est} < 0.9 = LERs	Mean values: M: 1.34 ± 0.02 F: 1.23 ± 0.02 LERs in M: 21% & in F: 25% 30% of LERs are OB, and 25% OW UR greater among priority ethnic groups, older age, OW & OB UR has increased since 1997 (from 6.1 – 14.7% in M, from 14.4 – 18.6% in F)	100%
Gnardellis et al., 1998 (Greece)	N= 9262 Urban & rural Greek population Gender: 58.1% F, 41.9% M Age: 30-82 yrs	Semi-quantitative FFQ	UR= EI < 1.14 x BMR	Average UR: 11.8% (13.5 M, 10.5% F) UR more common for men, lower education levels(ODDS of 0.76 vs. 0.60) & OB (16.8% vs.11.5% in OW and 7.3% in NW)	100 %
Gonzalez et al., 1999 (Spain)	n=23,289 F; healthy volunteers n=14,374 M Age: x=51.5 ± 7.9 OB: n= 6,999 Educational level: primary level (39.1%)	Dietary history questionnaire	EI : ER ratio ER= BMR x 1.55 (PA frequency used for Western countries)	Estimated UR for OB: 17.5% in F, 5.5% in M EI : ER ratios for OB F: 82.49 : 26.02, & for OB M: 94.50 : 27.86 No significant difference in accuracy to non-OB	100%
Hutchesson et al., 2013 (Australia)	N=9 F (OB & OW) Age: x=34.5 ±11.3 BMI: x= 29.2 ± 1.4	9d web-based food record	EI:TEE< 1; assessed by DLW	Mean reporting accuracy: 79.6% (UR in 4 participants) Web-based SR is consistent with other methods in accuracy	63%
Johansson et al., 1998 (Norway)	N=3144 Age: x= 42.7 (M), x=41.6 (F) BMI (M): UW: n=4, NW: n=54, OW: n=37, OB: n=5 BMI (F): UW: n=15, NW: n=59, OW, OB: n=5	FFQ	Goldberg cut-offs (EI:BMR < 1.35)	UR was more common in OB participants with desire to lose weight (p<0.001; desire for weight change in F: p<0.05) Average proportion of UR: 40-50% Link between BMI and UR can be explained by higher desire for weight loss in OB participants, however most UR can't be identified by BMI & change of weight Factors associated with UR: Female gender, obesity (9%), desire to lose weight (41%), less consumption of fat & sugar, attitude about body weight, older age, fibre & vitamin C intake	100%

Kretsch et al., 1999 (USA)	N=22, healthy F NW (BMI: x=21.3) & OB (50%, BMI: x=34.2) 16 Whites, 2 Blacks, 2 Hispanics, 2 missed Educational level: 10-16 years	7d food record using household measures	EI – estimated records Negative value= UR	UR rates for NW: -9.7%, for OB: -19.4% BMI correlates inversely with EI difference for NW (r= -.67, p=0.02) Depression correlated positively with EI difference for OB	75%
Lansky et al., 1982 (USA)	N= 25 F in 27-wk behavioural weight loss programme patients (F) OW: 27% Age: 22-55 yrs (x= 42)	Daily food records for 3 weeks (time and place of food eaten, quantity and calories), calorie guide was provided	Accuracy of participants' conversion from quantities into calories	58% of drop outs of weight loss programmes UR (vs. 23.3% in non-drop-outs) SR doesn't predict weight loss (r= -0.22 –0.30), findings support use of direct observation instead 46% make errors in report: 26% OR, 20% UR	63%
Lara et al., 2004 (UK)	N=184 F, Age: 18-65 yrs, seeking help for weight loss in primary care (Comparison with non-clinical control group) OB: n=37, OW: n=45, BMI<25: n=52	3-FEQ	SR via item assessing intention to misreport (options: high OR, moderate OR, high UR, moderate UR)	Overall misreport: 68%, BMI>30: 46% (both clinical & non-clinical groups) High OR rates (32%) in clinical OB After confrontation with UR, 46% admitted misreporting	63%
Lichtman et al., 1992 (USA)	N=224, OB in weight loss treatment Group 1: 9F, 1M (diet resistance) Group 2: 67F, 13M BMI: 33.8 ± 4.1 & 36.4 ± 7.3	Self-reported food intake recall over 14 days	Evaluation of recall about test meal the following day via investigator	One day after test meal subjects in group 1 recalled having eaten approximately 20% less than they actually ate (P<0.05), which means that UR is likely to account for diet resistance Group 1 subjects also displayed higher cognitive restraint, so this could further explain UR	75%
Little et al., 1999 (UK)	1)High risk group (n=61): risk for cardiovascular disease (56% M, Age <50: 52%, OB: 54%) 2)random population	Brief dietary assessment tools 7d weighed dietary record	EI: BMR <1.2	UR is common (40%) and more likely in OB participants (29% difference, p<0.001). UR rates for OB: 60%, non-OB: 30% (chi^2= 10.9) Simple SR tools show acceptable agreements with standard measures	75%

	group (n=50) (38% M, Age <50: 56%, OB: 18%)				
Lutomski et al., 2009 (Ireland)	N=7521; 1.3% UW, 38.9% NW, 43.9% OW, 15.9% OB	FFQ	Goldberg cut-off (EI:BMR < 1.35)	33% classified as UR (with men significantly more likely to UR), 11.9% are OR (most common in normal BMI & UW women) Odds of UR greatest among obse (2.16 OR)	100 %
Martin et al., 2003 (USA)	N=56, diabetes mellitus type II patients with prescription of low-fat diet n=28 intervention group n=28 control group n=25 M, n=31 F BMI ≥30: n=22, x=31.28	Interview-administered diet history; 3d food record	Goldberg cut-off for diet history interview EI:BMR <1.14, for 3d food record EI:BMR<1.06	UR more common in BMI>30 : 91% for diet history and 82% for 3d food record Increasing accuracy over intervention time of 12 months (p<0.05), suggesting that lack of reporting skills is initial barrier	75%
McKenzie et al., 2002 (USA)	N= 88 F(OW &OB) Age: 37.2 ± 6.1 BMI: 31.6 ± 3.9	2 dietary recalls (Multiple-pass 24hr recall): 1. Telephone 2. In-person	Goldberg cut-off (EI:BMR) adjusted to PAL, lower cut-off ratios (0.90, 0.94; 1.04 for low, medium & high activity)	Interviewer body mass index has no impact on accuracy of self-reported EI (p=0.19) UR occured in both telephone and in-person recall data (~26%) with no significant difference (p=0.57)	50%
Meng, X. et al., 2013 (Australia)	N=219 F, age : 70-80 yrs OB: n=50, BMI; OW: n=95, NW: n=72 (community-dwelling & recruited for dietary trial)	3d weighed food record	Goldberg cut-off (EI :BMR< 1.35)	BMI≥25 most significant cut-off for UR Highest likelihood of UR in obese category (32% of OB participants UR) Combination of high activity levels (p<0.001) & high BMI (p=0.001) is linked to highest chance of UR UR report fewer food items Prevalence of UR in elderly women: 49%	75%
Muhlheim et al., 1998 (USA)	N=28 unsuccessful dieters (OW & OB)	1-week food diary, N=17 continued 2 more weeks while being told that researcher could verify their report	EI:EE (measured by DWL technique)	Subjects in experimental group improved in their reporting accuracy compared to control group (52% vs. 48% of actual intake), thus, the belief that researcher can verify reports reduced UR Experimental group continued to UR (p<.0005), showing that UR can't be changed easily	75%

Study	Sample	Method	UR measure	Results	Quality
Mossavar-Rahmani et al., 2013 (USA)	N=450 F (postmenopausal) n=156 NW, n=121 OW; n=173 OB	FFQ; 4DFR; 24hr recall with focus on EI & protein intake	Goldberg cut-off (EI:BMR<1)	Small influence of BMI on UR, higher for EI (r=8.1%) than protein intake (r=4.1%) Psychosocial factors play small role in UR: social desirability (increased for UR), meals at home (decreased for UR)	87.5 %
Murakami et al., 2013 (UK)	N=1487 (687 M , 809 F), random adult sample Age: 19-64 yrs, BMI: x =27.3 ± 4.4	7d weighed dietary record with support from trained interviewers	EER:EI = 1 (95% confidence interval)	Obesity has significant influence on UR (P<0.001) 33% of male UR are OB (vs. 18.5% in AR) & 31.8% of female UR are OB (vs. 13.2% in AR) High dietary glycaemic load may explain UR-OB link (only present in OB under reporters)	100%
Pietlänien et al., 2010 (Finland)	N=24 MZ twins (N=14 OB (BMI difference: 5.2 ± 1.6kg/m^2) N=10 control pairs (MZ twin)) Age: 24-28 yrs (x= 25.7)	3d food diary & Eating behaviour questionnaire	TEE, measured by DLW Wicoxon test was used to analyse whether UR was significantly different from zero	UR is considerable for OB twins (3.2 ± 1.1 MJ/day, P=0.036), OR in participants with high PAL (1.8 MJ/day, P=0.04), but only in OB (25% of total EE vs. 8% in non-OB) Both co-twins agree that OB twin consumes more food/snacks more than non-OB Results highlight that non-shared environment, or lifestyle behaviours, account for UR	63%
Popitt et al, 1998 (UK)	N=33 F (18 OB (x=40.5 kg/m^2) , 5 non-OB (x=23.7 kg/m^2), recruited for long-stay metabolic facility Age: x= 42 ± 14 yrs (20-65 yrs)	24hr-recall of communal meals (selected from menu with options incl. high/low-fat and high/low sugar)	(Reported intake/ actual intake) x 100 Analysis with paired t-tests (p < 0.05)	Total reported daily EI was inaccurate (87.5%, p<0.01), incl. 25 UR & 8 OR. Meals were accurately reported in both OB & non-OB participants, but snacks (between meals) sign. UR (P<0.001). Reported EI from carbohydrates & added sugar < actual intake (p<0.001), but accurate for protein & fat (p>0.05). Overall no significant Differences between OB & non-OB	63%
Samaras et al., 1999 (UK)	N=436, twin study in hospital setting Age: x= 58 ± 6 yrs BMI: x= 24.3 ± 3.6 (5% OB; 30% OW; 65% NW)	7d food record (n=197) 'Oxford type' FFQ	EI – BEE x 1.35 < 0	Age wasn't found to be linked to UR UR occurred more commonly in OB participants (44% vs. 39% in OW & 18% in NW; p<0.001) Reported EI in UR sign. lower in fat, similar in carbohydrates and higher in proteins than AR	87.5%
Schebendach et al., 2012 (USA)	N=40 (10 OB: 2M and 8F; 18 AN, 12 NW) BMI: 33.9 ±2.4)	4d food record during laboratory meal study	Bland-Altman plots	Obesity is linked to UR (p= 0.016); average UR of 19% (160kcl/ day)	63%

Scaglusi et al., 2012 (Brazil)	N=65F (28 NW, 10 OW, 27OB) Age: 33.7 ± 10.8 BMI: 27.9 ± 6.7 Education (years of study): 12.9 ± 2.3	3 x 24 hrs recalls 3d food record FFQ	EI: TEE <0.69 (24 hr recall) EI:TEE <0.68 (food record) EI:TEE<0.82 (FFQ) Total EE measured by DLW	UR in OB: EI:TEE in OB is 0.70 ± 0.24 for 24hr recall, 0.68 ± 0.22 for food records and 0.76 ± 0.34 for FFQ For all 3 measures sign. more UR than in lower BMI categories (p<0.05) Spearman correlation for BMI & EI:TEE: -0.47 (p<0.001) UR varied across methods, FFQ having the lowest accuracy	63%

Shanshin et al., 2012 (Iran)	N=187 F
	`BMI≥30: 35.8%`
	`(x=27.7)`
		Semi-quantitative 168-item FFQ	`Goldberg cut offs (EI:BMR ≤1.34)`	UR rate across all weight categories was 35.5%
				OB: 48% UR, 30% AR, 21% OR
				higher resting metabolism is linked to UR (p<0.05)
					88%

Svendsen et al., 2006 (Norway)	N=50 (n=23 M, n=27 F) OB with metabolic risk factors BMI: x= 35.7	FFQ (90 days) Dietary records (3 days)	EI:TEE < 1.0	56% of the participants are identified as UR UR have lower intake of bread, sweets, desserts & snacks (100 vs. 161 g/d in OR; P=0.008) UR have higher scores in dietary restraint (P=0.028)	63%
Vansant et al., 2006 (Belgium)	N=137 F Age: 40 ± 12 BMI: 38.2 ± 6.0 Attendants of outpatient obesity clinic	Dietary history (obtained by trained dietician)	EI:EE (EI >10% lower than EE)	16% were over-reporters, 66% were under-reporters (mean level of UR: 18.0±29.1%) Restrained eating was associated with UR (P<0.01)	63%
Westerterp-Platenga et al., 1996 (Netherlands)	N= 68 F BMI: n=34 OB, n=34 non-OB Age: 20-50 yrs	Food intake diary with household measure incl. Harris Benedict equation	UR = reported EI < 10% of actual intake	Non-OB: 8.7% UR ; OB: 8.8% UR OB consumed significantly more energy, esp. from highest energy density category (24% vs. 13% in non-OB), and sign. fewer calories from lowest energy density category (24% vs. 38%)	75%
Yvas et al., 2003 (UK)	N=416 adult Pakistanis & Europeans in Manchester Age: 25-79 yrs BMI: x=27.0 – 30.2	FFQ	EI:BMR < 1.2	UR had higher BMI in all ethnic groups & lower reported EI UR in M: 73.6%; UR in F: 77.5% Ethnic group and gender had no influence on UR rates	75%

Note: AN= anorexic; AR= accurate report; BED= binge-eating disorder; BEE= basal energy expenditure; BMI= body mass index; BMR= basal metabolic rate; CI= Confidence interval; d= day; DLW=doubly labelled water; EE= Energy Expenditure; EER = energy efficiency ratio; EI= Energy intake; ER= energy requirements; F= female; FFQ= food frequency questionnaire; hr= hour; LER = low energy reporter; M= male; MZ= monozygotic; NW= normal weight; OB=obese; OR= over-report; OW=overweight; LER= low energy reporter; TEE= total energy expenditure; PAL= physical activity level; RMR = resting metabolic rate; SR= Self-report; UR= under-report

In general, researchers were interested to obtain insights from the participants' eating behaviour in their day-to-day environment. For example, Popitt et al. (1998) observed study participants during communal meals to test how menu selection impacts self-reporting accuracy. The reporting accuracy was frequently measured by using Goldberg cut-offs (n = 10), and various authors stated using alternative cut-offs deriving from ratios between energy intake and expenditure (n= 13). Less common methods included the doubly labelled water technique (n = 4), correlation between recall and actual meals (n = 2), geometric means (n = 1) and Bland-Altman plots (n = 1). Two studies, however, didn't specify their method of evaluating self-reports coming from study participants (Lara et al., 2004; Lansky et al, 1982). The quality of the included papers generally ranged between 50% and 100%. The most common result was 63% (n = 11), which was often due to non-random sampling and using specific groups, such as clinical populations or intervention participants. Furthermore, several studies had very small sample sizes that were unlikely to result in adequate power for the statistics applied.

The results of the identified papers demonstrate that lacking reporting accuracy generally occurs across all participants, regardless of BMI, gender and other demographic factors with average rates from 11% (Gnardellis et al., 1998), 33% (Lutomski et al., 2009) and 40 – 50% (Johansson et al., 1998). Regardless of their weight, it was found that women are more likely to under-report their energy intake than men (Shanshin et al., 2012; Johansson et al., 1998; Fereidon Azizi et al., 2005 (p < 0.001)) with the exception of two studies where slightly higher accuracy rates were identified in women compared to men (Gnardellis et al., 1998), a different paper, on the other hand, found non-significant differences between gender(Yvas et al., 2003). Overall the gender link tends to increase with age, as nearly half of older women under-report, while the rates for male are significantly lower with 29% (Cook et al., 2000). Therefore, it isn't surprising that age is revealed as one risk factor for under-reporting (Fereidoun Azizi et al., 2005; Gemming et al., 2014), however one study did not confirm this association (Samaras et al., 1999). Another factor appearing to occur more commonly in

the context of under-reporting is a lower education level (Gnardellis et al., 1998).

According to the present findings, there is a consistent and clear link between under-report of food intake and an obese BMI in a considerable amount of included papers (n = 22). In contrast to this, Garriguet et al. (2008), Westerterp-Platenga et al., 1996) & Gonzalez et al. (1999) found that obese people do not differ significantly from different weight categories. Interestingly, self-reports of salt intake were more accurate in obese participants compared to their normal weight counterparts (De Keyzer et al., 2015). Another study found that obese people in a clinical setting are more likely to over-report than under-report (Lara et al., 2004). In regards to the previously illustrated link between accuracy and gender, Cook et al., 2000 go as far as defining obesity is the only factor that can predict under-report in women. However, other findings suggest that under-report cannot be identified only by looking at people's BMI (Johannson et al.1998).

Across the findings, several factors associated with under-reporting in obese people can be identified; hence they may contribute to explaining why it is more common for this BMI category. In regards to demographic characteristics, higher education emerged as one possible contributing factor (Abbott et al., 2008). Moreover, certain psychological factors seem to occur to a significant level in obese people who under-report, mostly in regards to their views and attitude towards their own body. These include desire to lose weight (Johannson et al., 1998), less realistic weight loss goals, body shape concerns (Abbott et al., 2008), depression (Kretsch et al., 1999) and cognitive restraint (Lichtman et al., 1992). Furthermore, dietary or eating habits add further clarity to the link between obesity and under-report. These include a higher consumption of foods with a high dietary glycaemic load (Murakami et al., 2013), and lower intake of bread, sweets, desserts and snacks (Svedsen et al., 2006). Interestingly, under-reporting is particularly prevalent in obese and older individuals with high physical activity levels (Meng et al., 2013). However, this link applies to over-reporters with an obese BMI to a similar extent (Pietlänien et al., 2010). In the context of exercise behaviour, Abbott et al. (2008) provides the added insight that certain psychosocial influences lead to under-reporting, including higher

perceived exercise competence and having social support for exercising. Overweight and obese people with a binge eating disorder are slightly less accurate in their self-reports, however not significantly. For this specific population subjective less of control, increased energy intake during binge eating episodes in combination with reduced awareness of food consumption can lead to under-reporting (Bartholome et al., 2013).

Considering that despite the high number of studies being included in the review no meta-analysis was performed, it is worth noting that there were several reasons leading to the decision against conducting one. Firstly, there were significant differences regarding the quality of the studies, which generally ranged from 50% to 100%. Based on the information provided by the authors the main deficiency of several studies was that they failed to randomise their samples (n=11). Furthermore, there were noticeable difference between the participants for different studies: The sample sizes of obese participants varied greatly from n=9 to n=155, while other studies did not state the exact number of those explicityly (n=8). Another aspect that makes a comparison questionable is the fact that a considerable amount of papers (~30%) have solely included women in their sample. Therefore, there are several heterogeneous aspects that were identified in the designs and methods of the present studies which argue against carrying out a meta-analysis.

4. Discussion & Conclusion

The results of the reviewed studies are consistent in mirroring that under-reporting is more likely to occur in overweight and obese participants, especially in those reporting to be more physically active. According to the findings, gender is a key factor that is frequently found to be associated with under-report in obese participants, mostly revealing significantly higher rates in women. A possible explanation is that obese women expose a greater drive for thinness, body dissatisfaction and disinhibited eating than men or women with a lower BMI. One study found that this persists into older age and can impact the accuracy of self-reporting food-intake (Meng et al.,

2013). Consequently, self-reported EI data coming from obese people need to be treated with caution due to their limited reliability.

There are some limitations with the validity of dietary data that rely on participants' self-report, and there is the common criticism that results differ systematically from the participants' usual eating patterns and number of calories consumed. This assumption is derived from the common observation that the reported energy intake people with a high BMI, even if determined as accurate, is significantly lower than the number of calories required to maintain their body weight. One possible explanation is that participants who are aware that their food intake is being monitored and evaluated simply ate less than their usual intakes during the recording period. It is known that keeping a food record is known to influence eating behaviour. This is referred to as the 'Hawthorne' effect, in which participants improve an aspect of their behaviour as a result of being observed (McCarney et al., 2007). Furthermore, a recent study highlights that under-reporting has increased significantly since 1997. Considering the similarities between the surveys, the authors suggest that this tendency may be caused by a rising impact of psychosocial factors, such as social desirability and cognitive restraint. This increasing influence may be due to the rising pursuit of thinness, which can encourage disordered thinking and low satisfaction with body shape and weight, leading to reluctance to report the total amount of food eaten, as eating less calories or smaller portion sizes is perceived as socially desirable and more acceptable (Gemming et al., 2014). As the present studies suggest a strong link between under-reporting in obese participants and psychological variables, especially for women, this may partly account for a possible explanation. Different dietary self-report methods consistently find high under-reporting rates in obese participants, which means that there is currently no superior method for this population available which may increase reporting accuracy (Scaglusi et al.,2012).

Taking into account the most common methods used for assessing reporting accuracy it is striking that although the doubly labelled water technique is the most accurate way to evaluate reporting accuracy, it was only used in a minority of the studies, which due to financial constraints which shows that in practice the methodical quality needs to be

compromised if the funding for carrying out the study is insufficient to account for this added costs.

In the past authors have suggested several methods that have been identified in order to address the issue of low accuracy in calorie self-estimates. One option could be to simply inform the person about this bias by stating that their meal is twice that of his or her best guess, however this strategy has only shown limited effectiveness in correcting errors. Another option is to provide people with portion-size benchmarks that they can use in their daily lives as a reference point. Evidence suggests a solution that asks participants to report calories item by item instead of as a total, which has been associated with higher accuracy (Wansik et al., 2006), and could provide a promising approach that still requires further testing in future research. Martin et al. (2003) have observed that accuracy tends to improve over time and therefore requires practice. This suggests that under-reporting could simply be the result of an initial error bias, and could be corrected by giving the participants sufficient time to get used to the method, as for many people dealing with and assessing their eating behaviour on a very detailed level is something new, which means that they may not register all the foods they are consuming initially. Forming the habit of recalling and logging every item they eat over the course of the day only comes after repeated performance in which they increasingly become aware of their errors and compensate these. This is, however, put into perspective by evaluating the findings from another study which comes to the conclusion that under-reporting in obese people even occurs to a large extent after two weeks of consistent daily self-report (Muhlheim et al., 1998). Future research should explore this trend for a longer time period, as meaningful improvements may take longer than a few weeks. It is important to clarify the source of errors, especially whether the misreporting happens intentionally, for instnace due to social desirability, unintentionally (e.g. forgetfulness), or through intentional alteration of the diet as an observational study may create an artificial situation and can lead to potential bias. The three sources have been outlined in Section 1.2. based on a model developed by Macdiarmid et al. (1998), however the present systematic review failed to address the underlying reasons beyond demographic characteristics.

Nevertheless, a couple of recommendations for improved accuracy can be made for clinical practice with obese patients, although these are still preliminary and require further investigation in future research. In order to evaluate energy intake reliably, it may be beneficial to allow an extended timeframe in which individuals have the opportunity to practice recording their food under supervision with feedback. Additionally increasing and reinforcement of their awareness of the existing under-reporting bias may be an effective method to increase the accuracy of their food records. This method may have the potential to provide clinicians and dietitians with a more realistic picture of actual energy intake in their obese patients, and start shedding light on eating behaviours and dietary sources that may be linked to individuals' weight gain or persistent inability to lose weight, therefore identifying particular dietary sources that need to be addressed to support weight management.

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Competence 2.0

Behaviour change intervention

Web-based intervention for teenagers with Juvenile Idiopathic Arthritis and Paediatric Plaque Psoriasis and their parents to improve self-management

Contents

Introduction

This case study summarises the learning outcomes of the Behaviour Change Intervention competency that forms part of the Stage 2 Doctorate Training in Health Psychology. It aligns with the primary aim as specified in the BPS Quantification in Health Psychology (BPS, 2009). This report will elaborate the rationale and the development of a health behaviour change intervention undertaken during my training in detail using reflective commentary. Furthermore, the validation and evaluation will be outlined to describe the process exhaustively. The insights feeding into the interventional concept will be put into context of health psychology theory, applying the COM-B model in order to contextualize drivers and barriers for the relevant health behaviour (Michie et al, 2014). The findings from the intervention outcomes will be discussed in regards to future implementation and considerations for designing interventions targeted at the particular population which were the focus of this programme.

Assessment/ Formulation

The intervention that was selected for the competency assessment is a digital, web-based intervention targeted teenagers (aged 13-17 years) with Juvenile Paediatric Arthitis (JIA) and Paediatric Plaque Psoriasis (PP) who are prescribed to a biological injectable treatment. An additional component of this intervention was designed for parents for younger children (aged 3 – 12 years) with the same conditions. The primary aim of the intervention was to improve self-management in the context of their chronic condition with particular focus on symptom management, social support and treatment adherence.

At the beginning of the development process I undertook an extensive review of currently available literature to identify preliminary insights into the challenge in order to inform preliminary ideas to input into a preliminary intervention concept. The initial insights revealed that chronic illness presents teenagers with significant stress associated with risk for emotional and behavioural problems, and can therefore impact on individuals' ability to manage their condition and treatment (Compas et al, 2012). Furthermore, accounts of parents of children with long-term

conditions suggest they feel unsupported in their role as a "manager" of their child's illness (Smith et al, 2015). This is particularly concerning, considering that adolescence is reported to be period of special stress (Blakemore & Mills, 2014). However, there is little known evidence coming from directly from the teenagers' perspectives of living with psoriasis, and the limited evidence available for JIA suggests a detrimental effect on teenagers' quality of life, including physical and social functioning (Haverman et al, 2014; Schanberg et al, 2003), treatment burden (Rapoff, 2016) and emotional difficulties (Tong et al, 2012).

Another domain that is often impacted by JIA, which is particularly relevant for the paediatric population, is school and interactions with peers: Across the present literature, parents, nurses and patients report that their condition impacts on school performance and, as well as their parents' professional life on different levels, including:

● Impact on school functioning and performance (Haverman et al, 2012)
● Decreased or impaired capacity for social activities (Tong et al, 2012: Schanberg et al, 2015).

    As a particularly critical period in terms of accepting and adjusting to a chronic illness, the time after diagnosis has often be reported, which is usually at a young age, and parents often describe this period as an "emotional rollercoaster", as well as being in shock, disbelief and fear due to the uncertainty, which often triggers emotional distress (Gomez-Ramirez et al, 2016; Grootenhuis & Last, 1997). Additionally, having JIA can trigger problematic social behaviour in some patients, for example difficulties to find friends and withdrawing from parents and peers (Sandstrom et al, 2004).

    In general, JIA and psoriasis are poorly understood conditions (Britton & Moore, 2002a; McNeill, 2004; Waite-Jones & Madill, 2008). Various people from individuals' social networks, including family and the immediate social circle such as friends, often dismiss the impact of JIA, mostly probably due to invisible nature (Tong et al., 2012). On the other hand, the visible symptoms of psoriasis often lead to bullying and stigma, and peer rejection, which may trigger feelings of isolation and sadness (Sandstrom et al, 2004). For patients in their adolescence, transitioning from

paediatric care into adult service can represent another challenge due to subjective pressure to behave like an adult and to be independent around their self-care behaviours in the context of their condition (Butner et al, 2009; Whitfield et al, 2015). This shift in autonomy can be challenging for both patient and carer, as patients gradually take on more responsibility and acquire skills and knowledge. Other patients and parents worry about losing support, since adult care tends to have a less dense support network in the health system, where there is lack of consistency and consensus around support guidelines, highlighting a clear need for improved guidance to support this transition by providing materials and education measures, as well as personal, individualised support provided to patients in order to navigate and coordinate the process (Davies et al, 2014).

Treatment management

In many cases children show motivation to gain knowledge about their treatment and usually know the basic underlying mode of action that causes their condition (Tong et al., 2012). However, barriers to understanding the medical terminology are still common (Guell et al, 2007). Research shows that managing of JIA tends to be the focus of family life and impacts the family system. The time spent on treating the condition via self-injections, which is often time-consuming, limits time for family activities and can be detrimental to the allocation of traditional family roles and relationships, such as older siblings' added responsibility through additional responsibility in supporting their brother or sister and parents (Britton & Moore, 2002a, 2002c; Jones et al., 2009; McNeill, 2004; Sällfors & Hallberg, 2003; Waite-Jones & Madill, 2008). Although taking biologic treatment is associated with high treatment efficacy and significant improvements in symptoms, a significant group of patients report difficulties around taking medication properly (Eyckman et al, 2011). According to healthcare professionals, for patients with JIA and PPP that are prescribed biologic treatment, adherence consists of several behaviours – injecting the medications as well as attending medical appointments and examinations (Len et al, 2014).

Considering that children and their parents with JIA and PPP face challenges on multiple domains around managing disease and treatment,

literature suggests that there may be a lack of support and informational resources they are able to access in common medical practice: There is evidence that the majority of patients haven't received any additional support, or have the information and training found insufficient or non-ideal, with frequently reported reasons being a wrong demonstration of the injection, lack of psychological support, as well as lack of physical access This is particularly concerning, as these factors have been associated with non-adherence to treatment (Ulrich et al, 2002; Whitfield et al., 2015). Despite the robust support that the disease has a detrimental effect on multiple domains of quality of life, both for the paediatric patient and their parents, there is little known about the exact nature and extent.

Altogether, these identified support needs highlight clear scope to explore disease-related experiences from the perspective of teenagers with JIA and psoriasis, which can hlep identify relevant particular support needs for this patient group and their parents in order to design an intervention that addresses patients' challenges around disease and treatment self-management.

Intervention & integration of theory, practice and research

In order to ensure that the planned intervention fits with the individual and specific needs of the targeted populations, as part of a research team consisting of one more person and a senior health psychology specialist who oversaw our work, I was in charge of the development of the intervention during all stages involving multiple 1:1 telephone-based interactions with potential end users that identified relevant support solutions, which informed the pilot website. We then tested the proposed website elements with a selected sample of end users and feedback in regards to its usability, relevance of content, tone and style.

Co-creation and validation phase

In order to understand the relevant support needs of the target group, how the desired support solution should be delivered, a team consisting of myself and two other researchers interviewed 63 participants individually via telephone for 60 minutes per interview (teens n=15; nurses n = 16; parents n

= 32), applying the principles of co-creational research (Viswanathan et al, 2004). Discussions were around experiences and challenges of JIA and paediatric psoriasis. Potential support concepts were also discussed. The interviews were recorded, transcribed and analysed using thematic analyses by myself and another researcher in my team to allow opportunity for interrater-reliability, (Braun & Clarke, 2006).

The thematic analysis identified seven common challenges around managing JIA or psoriasis as well as self-injection treatment for teenagers and parents of paediatric patients:

1. Illness & Symptom burden

JIA and psoriasis places a huge burden on parents and teens and impacts life in many ways, frequently a result of the unpredictability of symptoms, physical impact (e.g. pain), the impact on work and school, relationships, recreation and future goals.

2. Unhelpful beliefs about condition and treatment

It became evident that some beliefs about the condition and treatment held by parents and teens are not always accurate. Many have a limited understanding of illness and treatment, or wrongly believe it may go away with time.

3. Treatment burden

Although treatment with biologics is life-changing for some, it can place a large burden on patients and families in terms of time, effort, distress, and needing to rely on others.

4. Feeling alone

Patients and parents reported that others do not understand the condition itself, or the impact it can have. This ignorance can lead to bullying and exclusion, leaving teens and parents feeling isolated and alone.

5. Emotional burden

Having to manage a difficult condition and treatment regimen can bring up a

range of difficult emotions for teens and parents, such as uncertainty, injection anxiety, helplessness, worry, guilt, or depression.

6. Poor access to support

Overall findings suggest that external support is difficult to access. Support from healthcare professionals is often perceived as either life-changing in a positive way, but in some cases disappointing. Moreover, many patients and parents worry about the transition from paediatric into adult care, as they believe the quality of the provided support will decrease.

7. Independent self-management

Throughout the journey living with JIA or Psoriasis, the roles and responsibilities of parents, children, and nurses shift, and this process can be difficult to navigate. Many teens want more independence.

The main areas of support needs are summarised and mapped to the relevant themes, proposed content and tools for delivery in the following table:

Table 1. Clinical framework mapping identified support needs with appropriate support solutions.

Type of support requested	Relationship to challenges from research themes	Participant-generated ideas for content	How delivered
A. Trusted & Age-Appropriate Informational Support	The research showed that patients and parents perceived poor access to informational support *(theme 6)* and feel isolated from others with the condition *(theme 4)* . Due to the significant illness and treatment burden *(theme 1 & 3),* patients and parents need illness specific and age- appropriate information to support this challenge.	● Content that is designed and written with HCP input, with explicit expert advice from HCPs to ensure it is perceived as trustworthy. ● Tone and style of content that teenagers can relate to (e.g. use of celebrity role models, uplifting stories). ● Content that helps parents teach younger children about the condition (e.g. picture book, video animation). ● Informational support to increase awareness of available support in the community (patient-focussed events about the condition, support groups, charities, other websites)	1.Website (videos, online tracking) 2.Nurse chat via App or online forum
B. Practical Support	Based on the symptom and treatment burden *(theme 1 & 3)* patients and parents need practical solutions to support self-management. Given patients need to ultimately independently self-manage, they need support and practical tips for how to achieve this *(theme 7).*	● Online tracking of injections, symptoms, and blood-tests. ● Diaries and organisers to help plan and manage the treatment regimen. ● A reminder function for medication and appointments on an app would be useful.	1.Website (videos, online tracking) 2.Nurse Calls/live chat on App or online forum 3.App

C. Access to others with same condition	Patients and parents often do not know other people going through the same experience, and feel alone *(theme 4)*. They also feel a great emotional burden *(theme 5)* and want to be able to share these feelings with other people who understand and relate to their challenges.	• Ability to understand others experiences and share tips and coping strategies with others around how to deal with symptom, treatment, emotional, and social challenges. • Be able to upload their own pictures or videos to share with others. • A desire to support other patients with their learned coping skills • Quality of information shared can be monitored by a HCP to ensure information is accurate	1.Online forum 2.Patient & Parent videos 3.Patient & Parent stories
D. Greater access to HCPs	A key challenge for teens and parents is gaining access to HCPs *(theme 6)* to ask questions and gain knowledge about the condition. This means that unhelpful beliefs about condition and treatment can persist without being challenged by a HCP *(theme 2)* and it poses a threat to teens' ability to learn to independently self-manage *(theme 7)* as their questions and concerns can remain unasked and unanswered.	● Ask questions about condition and treatment, check injection techniques and procedures, receive support regarding side-effects management. ● For scheduled non-urgent calls, support for quality of life and emotional aspects of the condition is relevant. ● Be able to initiate this contact with the HCP, rather than just wait for an appointment. ● A dedicated person to speak to in-between appointments who is responsive and can offer valid expertise. ● HCP that is empathetic, has time to listen.	1.Nurse calls/ or live chat via App or online forum 2.Ability to post questions that are answered by an HCP on an online forum

Overall it became evident that a 'One Stop Shop' solution was desired to support the most relevant key needs expressed by patient and their parents. These findings were taken into account when designing an intervention, in terms of the topics, the delivery channel, tone and imagery. The insights were fed into a research report that was presented to the client as a rationale for the recommended content and features of the intervention. In the next step the proposed website was tested and validated with a sample of potential end users, as well as nurses working with paediatric patients from this population using a similar method to the previous research stage. The feedback informed any final refinements before the pilot of the programme was launched. Generally, the programme was very well received. Required changes based on user feedback were mainly around the imagery or format for a few of the proposed features. As there was an overwhelmingly positive response to videos, clips were filmed with several teenagers and their parents where they shared their personal experiences around managing their condition and treatment for different life domains. The final website stimuli are included in the appendix (see Appendix 1, p. 190).

Theoretical health model application

In order to map that all factors were addressed in the intervention explicitly and additionally facilitate the linking between the source of the barriers to suitable behaviour change technique, I used the COM-B model to organise the drivers and barriers of the targeted behaviours, which were summarised as overall self-management of illness and injectable treatments. At the core of this approach is a psychological model for explaining human behaviour intended to capture the range of mechanisms that may be involved in change, where B stands for behaviour, C for capability (both physical and psychological), O for opportunity (both physical and social environment), and M for motivation (reflective and automatic mechanisms) (Michie, van Stralen, & West, 2011). COM-B is intended to be comprehensive and applicable to all behaviours, and was developed with reference to existing theories of behaviour and a consensus meeting of behavioural theorists. It is considered as a starting point in order to map

interventions that are most likely to be effective. The model hypothesises that the interaction between the three components Capability (C), Opportunity (O) and Motivation (M) causes the performance of a behaviour (B), and hence can provide explanations for why people may not engage in a recommended or desired behaviour.

Further to the robust scientific background, this framework has been successfully applied to adherence in multiple chronic conditions (Jackson et al, 2014), it seemed sensible to use this model given its robust evidence in the particular context of self-managing a condition and corresponding treatments. The themes and subthemes from the findings based on the Thematic Analysis of the exploratory qualitative interviews were reviewed and organised into the COM-B model according to their most appropriate representation of the six components. The factors were linked to existing literature that had been identified in a previous scoping review of the literature where applicable (see chapter Intervention Rationale (p.195). This model guided my development process of the intervention through the exploration of relevant topics where support is required. Consequently, I used the resulting themes to inform the content of the various website elements, such as articles, videos and trackers.

Intervention implementation & Evaluation

Along with my research team I determined the appropriate timeline of the pilot intervention phase to be a total 6 months, as this duration has been identified as a meaningful cut-off for effective behaviour change that is likely to be maintained beyond programme duration (Petrie et al, 2011). During this time, participants were granted full access to the website with personal log-in data to their individual accounts, where they had exclusive insight into their personal data generated from various interactive activities, including personalised feedback and a dashboard with an overview of their self-tracked health data. Following completion of the pilot I applied different methods to measure the impact of the website on predefined objectives. The rationale behind using multiple methods to evaluate the predefined outcomes served the collection of measurable data.

Table 2. The COM-B Model applied to Self-Management in paediatric JIA & PPP patients.

Disease self-management		
1. Capability	**2. Opportunity**	**3. Motivation**
1.1. Psychological	**2.1. Physical**	**Reflective**
• Incomplete understanding about condition (incl. the cause, triggers, timeline) (Britton & Moore, 2002a; Guell et al, 2007) • Child's independence & involvement in own healthcare	**Treatment burden** (Rapoff, 2016): • Time-consuming & interfering treatment regimen (Britton & Moore, 2002a, 2002c) • Injections are unpleasant & distressing • Having to rely on others (Shaw et al, 2006) **Poor access to support** (Ulrich et al, 2002): • Relationship with HCP • Transition into adult services (Whitfield et al, 2015) • Lack of personnel & time resources	**Illness Beliefs:** • Perceived lack of control • Uncertainty about future **Treatment Beliefs** affect adherence behaviour: ● Self-efficacy, treatment efficacy & necessity beliefs associated with high self-reported adherence ● Concerns about side effects are linked to low self-reported adherence
1.2. Physical	**2.2. Social**	**Automatic**
• Symptom burden & management (Schanberg et al, 2003; Haverman et al, 2014) • Adolescence as a sensitive period (Compas et al, 2012)	● Social isolation & bullying (Schanberg et al, 2015) ● Absence from school/ work (Russo et al, 2012) ● Impaired relationship to family/peers ● Delayed social development ● Lack of public awareness & stigma (Sandstrom et al, 2004)	Mood (Gomez-Ramirez et al, 2016): ● Low mood & sadness (Shawn et al 2016) ● Injection anxiety ● Worry & anxiety ● Guilt & blame ● Helplessness & anger (Shawn et al, 2016)

effective the programme was for disease self-management, but also to identify more in-depth and detailed feedback for identifying particular drivers and barriers (e.g. positive and negative aspects including reasons) for an opportunity to optimise the intervention for future roll-out. Feedback about each website feature was obtained using a semi-structured interview technique via telephone to allow consistency with some degree of flexibility in the responses to elicit meaningful and specific comments. A quantitative scale per feature was used to allow quantifiable measurement of the effectiveness in regards to disease self-management. For pragmatic reasons we decided to assess the constructs solely via telephone to allow timely and cost-effective measurement as participants were based across the UK and Italy. The format used for the quantitative part of the evaluation included the following questions:

- *[For teenagers:]* How effective did you find [name of website feature] for improving self-management of your [psoriasis/ JIA] on a scale from 1 – 7, with 1 standing for not useful at all and 7 meaning extremely useful?
- *[For parents:]* How effective did you find [name of website feature] for improving self-management of your child's [psoriasis/ JIA] on a scale from 1 – 7, with 1 standing for not useful at all and 7 meaning extremely useful?

While the quantitative measurement aimed to identify outcomes in terms of relevant health behaviours, the focus of the qualitative questions was to explore participants' perception of the verbal tone, style, relevance of the content and visual illustrations, as well as ease of navigation and usability of the website. A 7point scale provided a robust measurement technique, as one of its benefits is that it provides the respondent with an appropriate balance between sufficient options for discrimination without overwhelming the participant. It is especially useful in the context of single item questions, as it is the case for this particular evaluation, as it is more efficient in distinguishing individual responses. The outcomes including participants' feedback and recommendations for future implications is presented below divided into different categories of the website elements.

1. **Articles**:
   Given the mixed outcomes in teenagers (ranging from 3/7 to 7/7) it can be concluded that there were conflicting views regarding the written articles. Reasons

for low value ratings was that the article was 'boring' and too lengthy, while others found the content included absolutely essential and very informative as novel ideas were provided. Some participants found that the layout could be more organised and compact, for example through the addition of a drop-down menu. One participant disliked the article format altogether and generally preferred videos. Insights suggested that the article was generally more popular with parents given the average rating of 6/7 to 7/7, as they found the advice useful and relevant with a good balance between familiar and novel information. The length and level of detail was deemed appropriate, though some requested additional information on strategies around managing mood as well as external links to support services. Others highlighted that more illustrations are needed to aid explanations to young children during discussion around their condition.

2. Videos

The videos featuring actual patients and parents had an overwhelmingly positive response, and nearly all participants gave a rating of 7/7 in terms of usefulness for improving disease self-management. Both teenagers and parents found the content engaging, reassuring and relevant. The delivery channel and format were described as interactive and personal.

3. Goal-setting tools

The goal-setting tool was the most controversial based on given feedback across both groups, with multiple participants giving very high but also multiple low scores in the context of its potential for improving self-management. Some teenagers and parents thought it provided a motivating and effective way to stay on track with their medication, and it was an interactive and "fun" concept. The reported key barrier for using this tool was that the concept overall felt more appropriate for younger children, particularly in the context of managing treatment, as some stated that improved symptoms should be a sufficient reason to motivate adherent behaviour. Some commented that the activity felt 'pointless' as it was possible to 'cheat'. The diverse and mixed responses led to an average of the score 4/7. Although this feature may be useful for some patients, it needs a clearer explanation as the concept of 'self-reward' was poorly understood in some cases.

4. Quiz

This concept was generally received positively as it appeared 'fun' and interactive resulting high utilisation rates. However, it was often misinterpreted as a personality test which seemingly lead to disappointment and disengagement during some website explorations. Nevertheless, the quiz was given a high rating in terms of valuableness (average of 6/7), but the fact that a personality or mood assessment seemed to be more desired should be taken into account for the content optimisation of the website.

5. Interactive roadmap

This tool was overall very well received by teenagers, as most gave a score of 6/7 to 7/7. The visual presentation of the journey was deemed positive and engaging, and teenagers thought it improved their independence after using it. They also liked the interactive nature of the tool given the ability to 'tick things off'. Some participants suggested adding more practical support around managing treatment (e.g. how to self-inject).

6. Transition checklist

The checklist was amongst the best rated website features with average ratings of 7/7 in both participant groups interviewed. Most participants described it as helpful, interesting and informative as it inspired new ways of thinking and ideas. Moreover, some found that it helped with their communication around independence between parent and child. Furthermore, others expressed that it built their confidence for managing healthcare, however most only used it once as they felt it was more like an initial once-off test, therefore regular updates with added questions were suggested for a more regular and continuous use.

7. Pinning tool

While all parents felt that this tool helped with managing the condition by adding useful resources and keeping their favourite content in a one-stop-shop (average score of 7/7), teenagers felt that it lacked in visual appeal, as it could be more colourful and interactive. Furthermore, some teenagers pointed out the possibility of possibility of positioning it as a general 'mood board', rather than just limiting to strictly disease-related content.

8. Health tracker

   Most participants found the health tracker extremely useful with an average rating of 6/7. They reported that this tool helped them self-monitor their symptom timeline as it provided useful personalised feedback and acted as a conversation opener between child and parent. Some participants suggested sending out reminders to prompt a ore regular use, and also provided additional symptoms and triggers to be included in the current drop down menu for this self-monitoring activity.

9. Appointment reminder

   Most participants found this feature highly valuable for managing their healthcare appointments, resulting in an average score of 7/7, with a few exceptions of parents preferring paper diaries or SMS reminders as they perceived accessing a website to be a barrier. A frequently reported positive aspect were its usefulness or convenience of keeping all appointments in one place.

   Regarding the overall qualitative feedback participants gave for the website, I was pleased to conclude that there were mostly only positive responses; only two parents and three teenagers reported that they did not access the website after using it for the first time, as they did not find its content relevant for more experienced patients, therefore the service could not add any value for them. The wide majority of teenagers and parents found that the programme was innovative, holistic, easy to use and led to increase confidence in managing their condition.

   Taking all findings into account more critically, there is still room for improvement regarding features and communication channels that were seen as important for supporting self-management, but were currently not included on the pilot websites. Multiple participants noted that they would have valued a platform to communicate with other patients, parents or HCPs in the form of a live chat or forum. There was a general appetite for more content around mood management and lifestyle. In terms of regular use, many participants, particularly teenagers, remarked that it would have helped and encourage them to use the website more regularly if they would have received reminders via SMS, email or notifications on their phone and received updated content across the different website tools more

frequently.

There are several limitations I identified during the evaluation process:

- There was no baseline assessment of the targeted outcomes, which limits the validity of the study. This was due to the nature and scope of this pilot programme and the required additional effort was not justifiable for this initial testing stage. Regular measurements including baseline will be implemented and maintained in regular follow-up intervals every three months for the full intervention roll-out.

- There was low transparency regarding actual utilisation and engagement with the website over time, and whether the extent of this was sufficient to provide qualified feedback that lead to the reported outcomes. However, given the fact that participants were able to describe the features precisely, we can assume that they must have engaged with it at least to some extent. For the full intervention roll-out CRM will be applied during programme roll-out for improved and detailed insight into utilisation rates of different features.

- Although there is overwhelmingly high demand to add a live chat and forum functions, the particular context of this project makes this difficult with the client being a pharmaceutical company. Due to legal requirements about reporting adverse events in association with their own products, there are strong concerns about eliciting these during provide communications that would require ongoing monitoring around the clock, which would not be feasible to ensure.

Overall, the outcomes and feedback indicate that the programme content can be valuable and effective for improving disease self-management. The recommended refinements, which will be implemented for the full intervention roll-out, will contribute to optimising the support for teenage patients and their parents. The findings during the two-stage developmental phase of the interventions were presented for two conferences, the 12th UKSBM (United Kingdom Society of Behavioural Medicine) meeting 2016 in Cardiff, as well the 3rd UCL Centre for Behaviour Change Digital Health Conference 2017 in the form of two

posters (Wehling et al, 2016; O'Sullivan et al, 2017), where I contributed either as a first or second author.

Reflective-practitioner stance

The entire process from developing to planning and implementing the intervention was a very interesting and novel experience for me, as it involved tailoring an intervention to a specific target group. During this process I had to consider various factors of the target population, such as age (teenager vs. young to middle-aged adult), disease indication (chronic and heredity conditions - JIA and Psoriasis), as well as the role of the end user (caregiver vs. patient). The regular evaluation and validation with the same population drove the development and refinements, as it made the final programme content and format feel increasingly relevant and user-centred. It felt extremely rewarding and personal to be involved in the entire process over nearly an entire year, beginning from the point the client contacted us, establishing contact with our testing sample and interacting with our participants repeatedly, and thus making the intervention relevant to their preferences and individual needs. The fact that throughout the development I was in close contact to some of the teenagers' parents made this connection feel even more special, as it gave me the impression to get an interesting insight into how the condition affected the family relationships. Therefore, it was at times challenging for me to keep an objective and professional distance that was required to make neutral decisions about keeping the intervention at a population – rather than individual level. Moreover, the design process exposed me to my first proper experience of conducting qualitative research, particularly involving thematic and content analysis in the programme NVivo, which is incredibly useful for other future projects, both in work situations as well as for my doctorate training. While I struggled to create themes in collaboration with a fellow researcher initially, I started noticing a significant improvement after a couple of months when we progressed from exploratory into validation research. It took much less time to establish research themes and I required less guidance. A particularly positive experience for me, which symbolised the impact and value of my work I have contributed to the roll-out and impact on patients' life, was that I

had the opportunity to present the intervention design and outcomes in various conferences and was able to share it with peers and important health stakeholders from various backgrounds.

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Appendix 1: Intervention stimuli

Website menu (homepage):

Personalisation questionnaire for parents:

Program Customisation Survey questions – parents

You can customise the program to meet your specific needs. Please you tell us a bit more about your current situation and experiences. We will advise your Care Coach before your first discussion.

1a. How well do you feel you understand your child's [illness]?

1 = don't understand at all   2 = understand slightly   3 = understand moderately   4 = understand clearly   5 = understand very clearly

1b. How long do you think your child's [illness] will continue?

1 = a very short time   2 = a short time,   3 = a moderate amount of time   4 = a long time   5 = forever

2a. How much does your child's [illness] affect you emotionally? (e.g. does it make you worried, angry, scared, upset, or guilty?)

1 = not at all affected emotionally   , 2 = slightly affected emotionally   3 = moderately affected emotionally   4 = very affected emotionally   5 = extremely affected emotionally

2b. How much does your child's treatment affect you emotionally? (e.g. does it make you worried, angry, scared, upset, or guilty?)

1 = not at all affected emotionally   2 = slightly affected emotionally   3 = moderately affected emotionally   4 = very affected emotionally   5 = extremely affected emotionally

3. How confident are you that you can keep your child's symptoms or health problems from interfering with the things you want to do?

1 = not at all confident   2 = slightly confident   3 = moderately confident   4 = very confident   5 = totally confident

4. I am satisfied with the relationships I have with the important people in my life and my child's life (e.g children, spouse, doctors, nurses, teachers, friends, colleagues)

1 = not at all satisfied   2 = slightly satisfied   3 = moderately satisfied   4 = very satisfied   5 = totally satisfied

5. I'm worried about my child taking their treatment

1 = not at all worried   2 = slightly worried   3 = moderately worried   4 = very worried   5 = extremely worried

6. I am satisfied that I can access all the support I need in relation to my child's condition

1 = not at all satisfied   2 = slightly satisfied   3 = moderately satisfied   4 = very satisfied   5 = totally satisfied

Personalisation questionnaire for patients:

Program Customisation Survey questions – patients

You can customise the program to meet your specific needs. Please you tell us a bit more about your current situation and experiences. We will advise your Care Coach before your first discussion.

1a. How well do you feel you understand your [illness]?

| 1 = don't understand at all | 2 = understand slightly | 3 = understand moderately | 4 = understand clearly | 5 = understand very clearly |

1b. How long do you think your [illness] will continue?

| 1 = a very short time | 2 = a short time, | 3 = a moderate amount of time | 4 = a long time | 5 = forever |

2a. How much does your [illness] affect you emotionally? (e.g. does it make you worried, angry, scared, upset, or guilty?)

| 1 = not at all affected emotionally | , 2 = slightly affected emotionally | 3 = moderately affected emotionally | 4 = very affected emotionally | 5 = extremely affected emotionally |

2b. How much does your treatment affect you emotionally? (e.g. does it make you worried, angry, scared, upset, or guilty?)

| 1 = not at all affected emotionally | 2 = slightly affected emotionally | 3 = moderately affected emotionally | 4 = very affected emotionally | 5 = extremely affected emotionally |

3. How confident are you that you can keep any symptoms or health problems from interfering with the things you want to do?

| 1 = not at all confident | 2 = slightly confident | 3 = moderately confident | 4 = very confident | 5 = totally confident |

4. I am satisfied with the relationships I have with the important people in my life (e.g parents, doctors, nurses, teachers, friends)

| 1 = not at all satisfied | 2 = slightly satisfied | 3 = moderately satisfied | 4 = very satisfied | 5 = totally satisfied |

5. I'm worried about taking my treatment

| 1 = not at all worried | 2 = slightly worried | 3 = moderately worried | 4 = very worried | 5 = extremely worried |

6. I am satisfied that I can access all the support I need in relation to my condition

| 1 = not at all satisfied | 2 = slightly satisfied | 3 = moderately satisfied | 4 = very satisfied | 5 = totally satisfied |

FOR PATIENTS: for use by qualified researchers for market research purposes. Not intended to promote or recommend any product. Speak to you doctor about any treatment concerns or questions. Paid for by a pharmaceutical company.

Menu bar:

| Home | About your child's treatment | Living with (X) | Useful advice | My trackers | Search |

Welcome > Peter

About your treatment
How to inject (X)
How (X) works
Injection quiz
Starter pack brochure
(X) PIL

Living with JIA
What is JIA disease?
Managing JIA symptoms and flares
My experience: managing my healthcare
What happens when I turn 18?

Useful advice
Tips for talking to parents
Telling other people about your condition
Making decisions
Dealing with low mood
Thinking traps
Dealing with information overload

My trackers
My JIA roadmap
Injection tracker
Health tracker
Transition checklist
My Rewards

Video for parents (Screenshot):

Tips to ease the mind

Popular videos

Lorem ipsum dolor sit amet
Consectetur adipiscing elit. Aliqu
magna, et faucibus a...
Read more
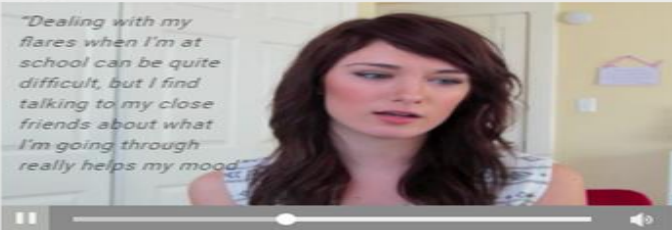
Lorem ipsum dolor sit amet
Consectetur adipiscing elit. Aliqu
magna, et faucibus a...
Read more

Lorem ipsum dolor sit amet
Consectetur adipiscing elit. Aliqu
magna, et faucibus a...
Read more

Your pinned articles

"There are days when it's really difficult to watch my daughter struggle at school, but I find that talking with friends and family does help"

Having a child with psoriasis can be a big emotional challenge for any parent. In this video, parents and nurses share some advice on making things a bit easier.

Video for patients (Screenshot):

Tips to ease the mind

"Dealing with my flares when I'm at school can be quite difficult, but I find talking to my close friends about what I'm going through really helps my mood"

At times, living with psoriasis can be tough to deal with emotionally. In this video, three teenagers describe their experiences and offer some handy advice.

Health tracker (version for parents):

The things that may affect your child's health and how they cope with their condition are:

• their physical symptoms (anything that you can see on, or that they can feel in their body, as a result of their condition)
• the things that may cause or 'trigger' their symptoms
• their mood.

Use this Health tracker to help you see if there have been any changes in any of these areas over time. The Health tracker can also help you learn more about how you might be able to improve their symptoms and mood.

GET STARTED

My child's symptoms

From the list below:

1. Choose a symptom that you think your child has a problem with
2. Rate how bad that symptom is
3. Select any triggers (the things that you think may have caused that symptom, or could be making it worse)

Add a Symptom

Select a Symptom ▼

Choose Severity ▼

My child's symptoms

▶

Health tracker (Version for patients):

Health tracker

Use this tool to keep track of how your condition affects your life.

GO

The things that may affect your health and how you cope with your condition are:

• Your physical symptoms (anything that you can see on, or that they can feel in their body, as a result of their condition)
• the things that may cause or 'trigger' your symptoms
• Your mood.

This Health tracker can help you see if there have been any changes over time, in these areas; it can also show you how you might be able to improve your symptoms and mood.

GET STARTED

○ Chart symptoms   ○ Thinkpoint   ○ Mood tracker   ○ Thinkpoint

My symptoms

From the list below:

1. Choose a symptom that you have a problem with
2. Rate how bad that symptom is
3. Select any triggers (the things that you think may have caused that symptom, or could be making it worse)

Add a Symptom

Select a Symptom ▼

Choose Severity ▼

Well done

You have completed your Health tracker **six times**.

Your results show that your symptoms are **settled**.

Have a think about what you have been doing since your last entry that may have helped with your symptoms.

You can find out more about managing your symptoms and flares. If you are worried about any of your symptoms in particular, talk to your doctor so they can see how you are doing and offer you advice.

Remember to come back once a week to see your most recent results.

< Back   Continue >

Transition checklist (Only for parents):

Transition checklist

Use this checklist to help you prepare for your child's transition to adult healthcare services.

FIND OUT MORE

Are they ready for more responsibility?

Gradually learning more about psoriasis and their treatment will help your teenager to manage more confidently. This can help them prepare for when they'll see new doctors and nurses and be expected to take more responsibility themselves as adults.

Working through the checklist below can help you to spot things that you have been doing for your child, that they could perhaps take on. You can come back and use the list as many times as you like – your answers will be stored so that you can track your child's progress.

| 1 | My child is able to name their condition and describe how it affects their body. | No | Almost | Yes |
| 2 | My child is able to name their medication and they know how much to take and when. | No | Almost | Yes |

Goal-setting tracking tool:

My Rewards

Learn about rewards

Get started

Set a reward

Enter text

60 Characters remaining

Set reward

A visit to the cinema

Set a new reward
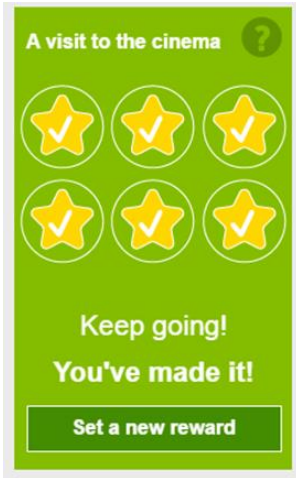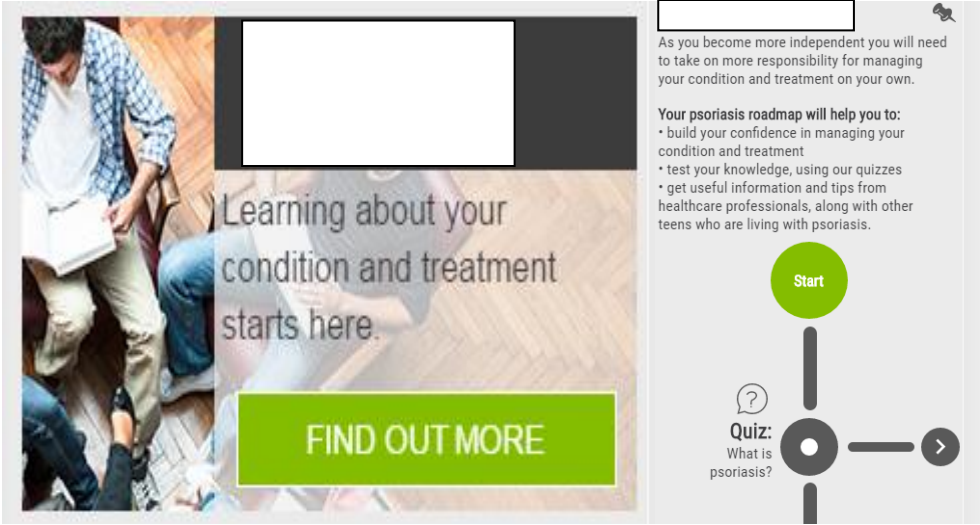
Appointment reminder:

Pinning tool:
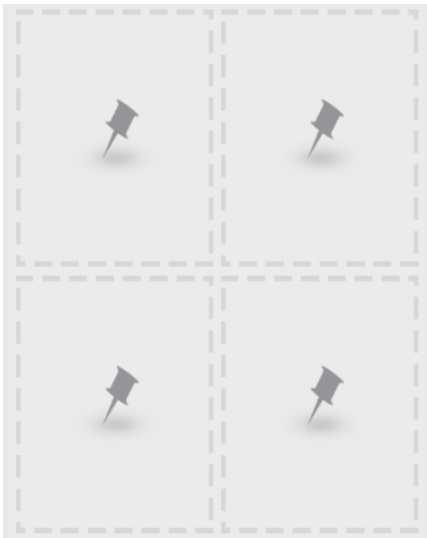
Health checklist (only for patients):

Learning about your condition and treatment starts here.

FIND OUT MORE

As you become more independent you will need to take on more responsibility for managing your condition and treatment on your own.

Your psoriasis roadmap will help you to:
• build your confidence in managing your condition and treatment
• test your knowledge, using our quizzes
• get useful information and tips from healthcare professionals, along with other teens who are living with psoriasis.

Start

Quiz: What is psoriasis?

Interview: What happens when I turn 18?

Becoming more independent and taking on more responsibility for managing your own condition and treatment is part of becoming an adult. Use this checklist to build up your knowledge. Once you've viewed any of the content on your psoriasis roadmap you can come back and use it again, whenever you like.

Article: Dealing with information overload (Version for patients - extract):

Dealing with information overload
Use this guide to help make sense of it all.

FIND OUT MORE
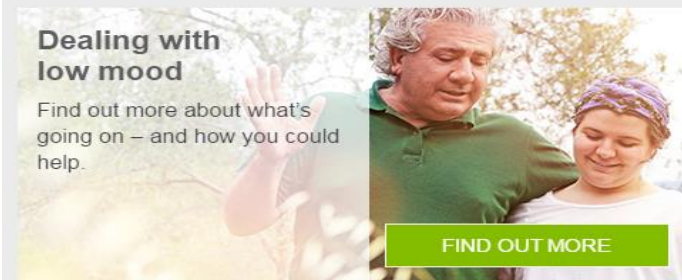
Dealing with information overload

You may have seen or heard lots of different information about your condition and treatment. Learning more could help you feel more confident about living with your condition, BUT taking in too much you could leave you worried or confused. We've got some ideas to help you find the right balance.

How can you make sense of all this information?
Here are some things you could try.

Article 1: Dealing with low mood (Version for parents – extract):

Dealing with low mood

Find out more about what's going on – and how you could help.

FIND OUT MORE

Dealing with low mood

It's normal for your child to feel sad or down from time to time. However, if you notice they're feeling this way for a long time, this may be a sign of something more serious.

What might cause this?
There are many reasons why any of us may sometimes feel down. At times it can seem unrelated to anything and almost appear out of nowhere. General signs you may notice if your child's mood is low could be:
• sadness
• panic
• tiredness
• worry
• anger
• frustration.

Article 2- Extract: Taking to Your Child (only for parents):

Talking to your child about JIA

It's not always easy to know how much to say to your child, however old they are. Read our tips.

FIND OUT MORE

Talking to your child about JIA

The amount of information your child is able to take in may depend on their age and needs. All children are different and you have probably already found some approaches to talking about your child's health and treatment that work for you.

Here, we share some tips that have worked for other families...

Talking to young children
It can be difficult trying to explain JIA to a young child. Try using simple pictures to help your child understand.

Quiz: Dealing with low mood (only for patients):

Dealing with low mood

Take our quiz and find out what could help

FIND OUT MORE

Quiz: Dealing with low mood

Dealing with the ups and downs of living with psoriasis might make you feel down or sad. It's normal to feel this way from time to time. But if these feelings don't seem to get better after a few days, or if you're finding things really difficult, it's important to talk about it with someone you trust, such as your parents, a friend, your doctor or nurse, or even your Care Coach.

Try this short quiz to help you to spot what signs to watch out for, and to learn about things you could try to help improve your mood.

Continue

Question 1

Which of these is **NOT** normally a sign of low mood?

A Feeling sad

B Feeling Worried

C Back pain
Your selected answer

Continue

Question 1

That's right, well done!

Back pain is not a typical sign of low mood. Other signs of low mood include:
· sadness or feeling hopeless
· tiredness, sleeping too much, or sleeping too little
· feeling like you don't enjoy things anymore·
eating too much, or eating too little
· worry
· frustration
· anger.

If you are going through these feelings, you may find that making some small changes can help.

For example, talking about any problems you may be having with someone close to you, getting some exercise, or trying to get more sleep can help your mood.

If you continue to feel like this for more than a few days, or if you ever have feelings of harming yourself, it's important that you let your mum or dad know right away.

Validating a web-based intervention for teenagers with chronic illness and their parents

■ Authors: O'Sullivan, A., Wehling, H., & NiMhurchadha, S. ■ Contact: anna.osullivan@atlantishealthcare.com

1 Background & Objectives:

▶ In a previous wave of co-creational research, with teens with Juvenile Idiopathic Arthritis (JIA) or Paediatric Plaque Psoriasis (PP), their parents, and rheumatology and dermatology nurses, we were able to identify relevant support needs and solutions for self-managing disease and treatment.

The feedback was that a web-based intervention as part of a wider support programme is favoured by teenage patients and their parents.[1,2] A functioning prototype of the website was designed and written based on the insights taken from the first wave of research. A user-testing approach was applied, as this has shown to be effective for validating a web-based programme from the user perspective.[3]

The aims of this research were:

- To obtain feedback about the web-based intervention to inform final refinements to the programme
- To test acceptance of tone, style; also to test relevance of the content and illustrations, ease of navigation and usability

2 Sample & Methods

The same 60 participants from the UK and Italy, who took part in our previous research phase were contacted, including teens (n=14) with JIA or PP, their parents (n= 31), and rheumatology and dermatology nurses (n= 15).

FEATURES OF THE INTERVENTION
The prototype was a preview of the proposed website, consisting of complete articles, video thumbnails, and semi-functional trackers and tools.

INTERVIEW PROCEDURE
All participants took part in one-to-one, semi-structured, qualitative interviews, which were web-assisted. Participants were asked to explore the website prototype on a provided link. Interviewers gained feedback about the website prototype using the Think Aloud technique.[4]

Before being shown the prototype, participants completed a neutral Think Aloud exercise as a warm-up. Each interview lasted 45-60 minutes and an audio recording was created for analysis.

CONTENT ANALYSIS
The data were analysed by two researchers using a qualitative content analysis approach to elicit structured feedback about the presented stimuli.[5]

3 Results: Participants' recommendations for a web-based intervention

CONCISE & HOLISTIC CONTENT
- Information should be delivered in a compact, concise format for limited user burden
- Demand for holistic advice (e.g. on lifestyle and mood) without specific mention of disease
- There is a risk of patronising the user if information is too basic or prescriptive

ENGAGING & POSITIVE VISUALS
- Images should be relatable and feature real people
- Imagery should convey positivity and hope
- Colourful star icons for goal-tracking activity were deemed too childish and inappropriate for teenagers

INTERACTIVE & MULTI-CHANNEL FEATURES
- Interactive trackers with personalised feedback
- Video clips featuring patients or parents sharing tips for managing a chronic illness
- Option to access mobile-friendly website or app version
- Reminder alerts for medical appointments
- Self-reward systems more applicable to lifestyle goals, but less applicable to adherence goals

OPPORTUNITIES TO FACILITATE SOCIAL SUPPORT
- Communication with other patients/parents via online forum
- Messaging service/online chat with HCP for specific advice or demand
- Regular telephone or face-to-face support with a health coach

SPECIFIC CONSIDERATIONS FOR TEENS VS PARENTS
- Teenagers prefer interactive websites with trackers, tools and videos, rather than receiving information passively
- A balanced mixture of traditional (e.g. written articles) and interactive channels (e.g. trackers, videos) is favourable for parents.

What brings users back?

- ☑ Clear and easy-to-use layout decreases user burden (time, effort) and allows convenient access to relevant information
- ☑ Information should be up-to-date and come from a credible medical source to reinforce relevance
- ☑ Customised and frequently refreshed content increases perceived need for repeated use
- ☑ Website should look attractive and come with a range of activities to engage teenagers over a long period
- ☑ Reminder messages via different channels prompting to content and tools are helpful in maintaining regular use
- ☑ Personalisation of activities adds relevance and meaning to support

4 Conclusion

▶ The research demonstrated that a web-based intervention is desirable for teenagers with a chronic condition and their parents, if it is customised to individual support needs around disease and treatment.

Newly gained and particularly important insights can be summarised as:

- The preferences of teenagers vs parents regarding communication channels support the need for the intervention to be tailored to the audience
- There is a demand for holistic advice and support on a range of life domains, as patients and parents don't always want to be reminded of the condition
- Despite the benefits of, and interest in, digital interventions, maintaining a complementary human element, for example via health-coach or peer-to-peer contact, continues to be highly important to parents and patients

The feedback from the interviews should be considered when designing supportive interventions to address particular needs and preferences of these target groups.

[1] Wehling, H., O'Sullivan, A. & NiMhurchadha, S. Teenagers' experiences of growing up with a chronic illness. Poster session presented at 12th LROBM Annual Scientific Meeting, 2016 Dec 1-2, Cardiff.
[2] O'Sullivan, A., Wehling, H. & NiMhurchadha, S. Parent's experiences of raising a child with a chronic illness. Oral presentation at the 12th LROBM Annual Scientific Meeting, 2016 Dec 1-2, Cardiff.
[3] Rosenbaum, S.E., Glenton, C., Nylund, H. K., & Oxman, A. D. (2010). User testing and stakeholder feedback contributed to the development of understandable and useful Summary of Findings tables for Cochrane reviews. Journal of Clinical Epidemiology, 63(6), 607-619.
[4] Willis, G. B. (2005). Cognitive interviewing: A tool for improving questionnaire design. Sage Publications.
[5] Mayring, P. (2014). Qualitative content analysis: theoretical foundation, basic procedures and software solution. URN: http://nbn-resolving.de/urn:nbn:de:0168-ssoar-395173

Competence 5.0

Teaching and training assessment

Contents

Introduction

This case study covers the planning and delivery of an MSc Health Psychology lecture at London Metropolitan University. The assessment includes the teaching and training competence of the training for the professional doctoral in health psychology. The title of the lecture was "Childhood Obesity" and it was part of the 20-credit module on Context and Applications in Health Psychology. The learning outcomes are identified and specified in the university course module booklet Context and Applications of Health Psychology PYP013: Year 2015-16. It is outlined by the module handbook that the learning outcomes for this module are measured via two pieces of coursework worth 50% each of the overall module.

This component of the teaching and training competence including the planning and theory behind lecture plan and delivery, including lesson plan development, identification of learning outcomes through the use of the module course book. In addition, the competency includes an outline of the planned teaching styles and rational for teaching styles implemented. Furthermore, the following assessment will address the learning outcomes and the evaluation as well as a personal reflection of the delivery.

Teaching plan development

During the development of the teaching plan a crucial consideration I made involved the fact that this lecture was one of ten different section about different contexts and application areas in the health psychology module. As the time of my delivery was towards the beginning of the semester as the second taught module, I was aware that the students were likely to still lack familiarity and experience with the upcoming topics, therefore this module needed to set the tone of the semester, while also keeping in mind that the knowledge about the basic health psychology concepts and theories may still be limited, if the students did not have prior exposure to extra-curricular learning opportunities. I decided to structure the lecture into three main parts as a clear and distinct structure helped me organise the available timeslot of 2.5 hours more easily, therefore allowing me to stick to the planned agenda more easily. These consist of factors contributing to

childhood obesity, interventions for this problem, and finally an interactive group exercise. After conducting a quick search on different scientific databases such as PSYCInfo and PubMed, I reviewed a number of papers that I felt were relevant to the intetended outcomes. I discussed and confirmed the objectives with my two supervisors by writing a brief teaching blurb to summarise what I am planning to focus on in terms of outcomes and how I will achieve this, which is provided below.

Childhood Obesity

This session will discuss the causes of childhood obesity by exploring genetic, environmental and behavioural factors, including social, physical and psychological consequences. We will then look into existing approaches to interventions that are specifically designed for this problem, and evaluate their impact.

Reading:

Ebbeling, C. B., Pawlak, D. B., & Ludwig, D. S. (2002). Childhood obesity: public-health crisis, common sense cure. *The lancet*, *360*(9331), 473-482.

Karnik, S., & Kanekar, A. (2012). Childhood obesity: a global public health crisis. International Journal Of Preventive Medicine, 3(1), 1-7.

Oude Luttikhuis, H., Baur, L., Jansen, H., Shrewsbury, V. A., O'Malley,
C., Stolk, R. P., & Summerbell, C. D. (2009). Interventions for treating obesity in children. *The Cochrane Library*.

Singh, A. S., Mulder, C., Twisk, J. W. R., Mechelen W. Van., & Chinapaw, M. J. M. (2008). Tracking of childhood overweight into adulthood: a systematic review of the literature. Obesity Reviews, 9, 5, 474–488.

Regarding the context of the lecture, the audience consisted of a small group of seven postgraduate MSc health psychology students (apart from one male all females), and one experienced lecturer who observed the lecture as an external reviewer. The teaching room was a standard-sized classroom,

and all students were seated in the first two rows due to logic reasons, as this was the closest location and directly opposite of me, which insured that the audience can observe my delivery and the projected slides more closely, facilitating direct and mutual communication with me and among each other during the exercise.

As I had met all the students in a previous session I delivered to them a while ago as a practice run, I was already familiar with their general learning and interaction style, but also their different backgrounds and strengths, which I considered for the concept of the session. As all students were on the Master's course in Health Psychology at the same university, this added clarity for me that they all had a certain degree of pre-existing and overlapping knowledge about psychology and have been exposed to different learning scenarios and academic, professional contexts in the past, either in teacher-led classes or independent or group-driven learning, as well as application of their knowledge through assignments, assessments and group exercises. Most students were at an average age that is generally typical for a Master's course (estimated between 20 and 25), while a single student appeared to be middle-aged. All students were either native or very fluent English speakers.

Learning theories used in developing teaching plan

When thinking about how I will be to able to accommodate different learning styles to maximise the outcomes, I came to the conclusion that although the attending students may have experienced various learning styles, this cannot lead to the assumption that each of them has similar needs or preferences about a particular method that they respond to the best. Two main theoretical approaches outlined across the literature are teacher-centred learning and interactive or student-based learning (Chall et al., 2000; Maloy et al., 2010). In the last session I delivered to the same group, I noticed that one half of the group was very engaged and communicative, and seemed to enjoy group discussions, while the other part of the audience appeared more reflective and focussed on the content that I presented in my oral presentation. Taking this into account, it seems appropriate to vary between different teaching styles to accommodate both expected preferences, and this

observation informed the choice of the methods I was going to apply in this particular educational context.

Teacher-centred learning styles apply verbal teaching structured into different themes with the teacher leading the interaction processes and communication. The advantages of this approach lies in its possibility of embedding a large volume of knowledge in a small amount of time. Furthermore, it enables a precise and holistic presentation of complex material, and allows the teacher to have more control over the audience through direct eye contact. Because every student is exposed to the identical material, it also creates a standardised learning platform for everyone. Some of the weaknesses include that it requires a certain discipline and concentration to listen from the audience. The learning style tends to be receptive and less proactive due to a lack of social stimulation, which may lead to disengagement (Chall et al., 2000).

In order to keep the session as interesting and interactive as possible, I decided to include a group exercise that involves problem thinking in the context of the discussed content. Considering the small number of attendants, this is a useful opportunity to engage in discussions with diverse inputs, and this environment will hopefully encourage every student to share their views and ideas. This requires a group work setting, which is classified as student-centred learning. This means that the class is usually divided into small groups while every group is assigned to a task that they are requested to complete in a limited timeframe (Dole et al, 2016; Knight, 2014). In a follow-up discussion with the entire class the results are summarised with a common conclusion. The instruction of the exercise should relevant for the lecture content and aims to promote cooperative skills and common problem solving. Benefits of group work include using problem-solving skills, critical thinking, and interpersonal skills. It may also build self-efficacy by sharing skills and knowledge among each other, and it could encourage quieter students to actively participate during the teaching session. A potential drawback about this method lies in the dependency on the motivation in the present group members, it also can be more time consuming and less goal-oriented which may cause an issue for a timely scheduled context with a

clear, institutional agenda. Moreover, this method has the risk of potential conflicts. Using a combination of both approaches as a complementary model was my teaching method of choice in the end, as both techniques have their own benefits and advantages, therefore combining both seems appropriate to ensure that students with own individual preferences or abilities for either of both styles can be considered and stimulated throughout the session.

Another theory I took into account when deciding about the lecture delivery is based on the three learning modalities (also referred to as VAK – visualising, auditory and kinaesthetic modalities) as identified by Walter Burke Barbe et al. (1979). The underlying principle is that while some people learn more effectively with visual modalities, for example through pictures or graphs, others find it easier to process information that are delivered by spoken language, which is commonly implemented by oral presentation of the content. Examples that work best for the third segment of learners include body movements and positioning of objects; in a teaching context this could be implemented by emphasizing the spoken content with gestures and moving around in the classroom to stimulate the kinaesthetic learners sufficiently. While the two main teaching styles outlined above address the *preferences* of the learner, they do not take into account that these may differ from their actual *strengths*, so a self-reported strength may not correspond with the empirical measures which this theory considers when identifying appropriate learning methods for individuals. This implies the urgency to consequently use and vary between the three methods and tools that make it possible to address all three learners; ideally each of these styles should be implanted equally and consistently throughout the delivery.

Besides the theoretical evidence that guided me in developing the lecture, I have delivered various training sessions in my current role as a Health Psychology Specialist to postgraduate pharmacy students where I have used similar techniques that mostly included theory-based learning via oral presentation, which were subsequently put into practice by accompanying interactive group exercises and group discussions. I feel that this experience has supported my ability to tailor content and delivery techniques to people who share an academic health-related background,

although the present group will be more familiar with psychology concepts and terminology, therefore less explanations and definitions of terms will be required.

Lecture material and layout

I decided to present the content via PowerPoint in order to ensure that I am able to engage different types of learners at the same time. Moreover, from a practical point of view this is the easiest and most convenient medium for me to use as there are computers with overhead projectors available throughout the campus facilities. Throughout the development and preparation of the presentation slides I set emphasis on designing visually appealing and stimulating material, meaning that I tried to incorporate very simple slides with descriptive graphics, but alternated these with a few figures and summarised insights to provide an adequate level of information density to allow sufficient scope for free and flexible speaking without being too close to the content of the slides, so that the presented content will need to be processed visually and auditory at the same time. This may optimise the outcomes from the point of view of different learners, as specified above. I sent the slides to the course leaders for review. The presentation was shared with the students to give them enough opportunity for to prepare for the lecture prior to the lecture date. Considering the assessment situation of this particular lecture, I ensured that I have access to a video recorder with appropriate quality including a stand, which I positioned behind the students to ensure while it captured my full body with sufficient proximity to ensure adequate sound quality, but also to prevent it causing a source of distraction for the students at the same time. Similarly, the observer sat at the back of the room to guarantee an independent, external point of view. The reason for this layout was that I wanted to keep the whole setting as natural as possible for the students, as it is well known that people tend to behave differently when they are aware that they are being observed, also known as the Hawthorne effect. Some students may be inclined to act in a more conscious and reserved manner, while it may lead others to put more effort into their performance. By keeping the assessment environment as minimal as possible and also the fact that the focus of the camera and the observer

would be on me, I hope that although the assessment situation will not interfere with the students' usual behaviour in teaching context.

Teaching plan

Date: 18/02/2016

Time: 10 am – 1 pm

Duration: 3 hours

Lecture title: Childhood Obesity

No. of students: 7 & 1 lead lecturer (observer)

Evaluative Report

This evaluation is based on the lecture delivered as part of the Teaching & Training competence for the Professional Doctorate in Health Psychology, which was delivered to seven MSc Health Psychology students on 18th February, 2016. The lecture title was "Childhood Obesity "and made up part of the module on Context and Applications of Health Psychology. The lecture was observed by an independent observer, a health psychologist, and further feedback was gathered from the attending student via written feedback forms.

Lecture Feedback

Feedback from the students was obtained via the use of ammonised evaluation forms covering how they rated: Overall teaching performance, teaching competence and presentation and relevance of the content regarding their expectations. The evaluation forms used a 5 point Likert-style scale with ratings ranging from "excellent (5)" to "poor (1)". I was particularly interesting in students' perceptions of my confidence in discussing and presenting the lecture contents, so I included a specific question that covered this aspect. This is because in my previous delivery a while ago, some students had commented. Additionally, I provided a section for students to

leave free text comments about certain specific aspects of my lecture they liked or disliked, which had the aim to identify potential important aspects that aren't covered in my questions (See Appendix for evaluation form).

I collected and reviewed the feedback forms right after the session to identify to what extent the training needs have been met from the audience's point of view. The present seven students had completed all questions, and the average ratings around my competence, confidence and level of engagement were 4 out of 5. All students stated that they felt more confident on the subject now, and that the lecture was useful and relevant to their training. One comment suggested to be "bolder" in my teaching style. In additional handwritten comments it was generally noted that I came across knowledgeable in a broad range of topics and delivered the content in a precise but flexible style without reading from the slides. Especially the group exercise was well received, as it provided the students an opportunity for discussion and "thinking further about the topic". There no necessity to compare these figures with national norms, as this module is part of a wider course and needs to be evaluated individually. The indicator for success of the outcomes is measured through individual scores on a Likert scale and additional hand-written notes from both learners and the reviewer.

I discussed my experience and the results of the training programme with my supervisor who had observed the teaching session, and we discussed the feedback that she had provided for me in the form of written notes. On a positive note, she found that my teaching style, including my speech, body language and interaction with the group was appropriate. She observed that the group was interactive and receptive to my content, especially during the class discussions. I demonstrated genuine interest and enthusiasm by responding to their queries and adding on to their inputs. I came across as friendly and encouraging while interacting with my audience. Regarding the teaching style I delivered, the observer thought that I applied a good mix of discussion or group work and presentation, which kept the students engaged and interested. For my future professional development she provided a number of suggestions and recommendations for me to reflect on and consider. Firstly, I shouldn't put myself down by apologising ("I hope

it's not too boring"), as this could affect how confident or competent the audience perceives me. According to my observer's perception I appeared a bit self-conscious and seemed too focussed on my own my behaviour at times, however the unnatural assessment situation most likely contributed to this. In general, I could have been more relaxed and flexible, especially regarding the time schedule. This became obvious when I ended a group discussion a bit too abruptly and moved on to the next topic, although it seemed that the group still wanted to input and share their views. During the discussion it may also have helped to change the layout of the room to move around them more easily and to encourage communication between the different groups.

A particular interesting aspect the observer pointed out to me was that I tended to focus predominantly on one part of the group with the students I clearly seemed to feel more comfortable with, leading to an increasing two-way discussion. This may have caused the students in the other corner to disengage at some point, as she observed that they started to use their phones or iPads. At one point she also noticed that the students started bringing in own experiences around healthy eating which is generally a positive thing as it demonstrates engagement with the content. Additionally, in order to link the shared experiences to the health psychology context, I could have asked the students to relate their personal thoughts to theories that are related to the subject.

Reflection on feedback and learning for the future

Regarding the scope for improvements around my teaching practice, there are various aspects that I am going to keep in mind for my own personal professional development. One thing that stood out to me as a deficiency is that I need to pay more attention to the technical quality of my presentation, which is easily preventable as this is a very practical element of the delivery. The feedback revealed that my slides weren't clearly visible due to bad lighting circumstances, and when they switched off during the group work I did not respond accordingly. Regarding the content of my slides, some of those could have been richer in content by summarising key points of studies that I discussed.

I agree with most of the observations from both learners and observer – although I did not think I was as confident on the inside as I came across. However, the fact that I had good ratings for my confidence, I can conclude that I have achieved one of my personal goals this time, which was to teach with greater confidence and self-assurance. The reason I was slightly apprehensive before hand also was that I felt slightly less familiar and experienced with the topic than in the previous lecture. The last time the topic was very closely related to my job-related skills and focus, so I had a lot of experience and background knowledge already, which was not the case this time. Despite this, I still have a strong interest in childhood obesity, which was the reason I chose the topic from the handbook. Allowing sufficient time to prepare the content before actually developing the material definitely helped me have sufficient competence on the topic. Additionally, I definitely felt more nervous this time, which is most likely a result of the additional pressure of being observed and filmed. I felt conscious about how I would look and sound on the video material, so this was definitely on my mind during the session and made my behaviour not as natural as it could have been otherwise. However, I was surprised when I looked at the material, and I seemed a lot less uncomfortable or nervous than I had the impression during my presentation. Regarding the technical aspects, I clearly need to be more alert and attentive, as one of the students pointed out visual issues with the lighting in the beginning. In response I closed the blinds and did not focus on this aspect for the rest of the session, despite it still being an apparent issue. I feel that I was extremely focussed on my oral performance and keeping my schedule as planned to notice subtle things. This also showed in my supervisor's observation of group members becoming disengaged towards the end of the group work by turning to their phones, which I completely missed. Also, I slightly regret being overly rigid with the time schedule and interrupting the interesting group discussion as I realised in the end that I would have had 10 more minutes to spare, which I could have used to take the conversation further by taking the group's thinking more into a solution-orientated direction. This could have potentially added more value to the outcomes of the group work and, and considering that the

group seemed to enjoy this part of the lecture the most, been more engaging and interesting for them.

My overall feeling after the session was positive and I was relieved that everything had worked out according to plan. However, I was a bit concerned about my perceived lack of in-depth knowledge and confidence around the topic, because I found that I was not always able to give satisfactory answers to questions, for example regarding question about bottle feeding that came up towards the end. On the other hand, I also realise that that very specific questions are asked during lectures, and you simply cannot predict what they may be about, regardless of how much you prepare. I have concluded that the role of a teacher isn't to be perfect and knowledgeable of everything, but more to guide the students in providing a deeper understanding and guide them by responding to their queries, which I did by offering to look into the question after the lecture and emailing the answer to the student.

Reflecting from my overall experience of teaching about childhood obesity, I have found that it's a highly complex problem within the health psychology context, and calls for immediate action. There is no simple solution to it. Existing literature demonstrates that there is a lot of effort from researchers and practitioners to tackle the problem, however trials often show only limited effectiveness in long-term behaviour outcomes. Therefore, it is difficult to find a "one size fits all" solution to improve outcome-related behaviours. While in discussions with relevant stakeholders and learners there may be vague and general recommendations and predictions without really knowing what actually works, hence it often feels like going around in a circle without finding a satisfying explanation or conclusion. The views and experiences of students should increasingly be linked to health psychology theory and practice during teaching sessions, rather than thinking about it in a non-directional manner. The ideas of the audience could then be compromised into an integrative model to approach a deeper and model-based understanding to guide future directions.

<u>Reflective commentary on video footage</u>

Background

This lecture made up part of my teaching and training assessment. The lecture was video recorded and observed by a senior lecturer and health psychologist. The recording was used to reflect upon teaching delivery. This was the second lecture I solely delivered at a post-graduate level. The students consisted of nine MSc health psychology students. The relevant content in the enclosed DVD can be found from minute 5:40 to 10:40.

Reflection about video footage & future learnings

When I looked back at the video footage, I was surprised to notice that my own impression during the lecture was definitely more negative compared to how I felt during the filming. I seemed relatively confident and my language was appropriate – I spoke fluently and freely with a good pitch and volume. In regards to my body language, I kept eye contact with the audience rather than looking at the screen. Something I could do better next time is linking different parts of the lecture, e.g. changing from a discussion into presenting content. I noticed that I appeared somewhat less confident with this, as I could improve in my transition naturally, and it did come across a bit blunt or clumsy at times. I will definitely aim to work on this by practicing lines before the lecture to help ease the switch of methods.

In relation to my body language, I think I came across as friendly in general, and smiled from time to time at the students. However, I did think that my nervousness showed a little bit in my appearance and behaviour – my face was more flushed than usual and I feel that I was using my hands a lot more than usual to accompany my speech. This is something that I wasn't aware of to this extent, but now thinking about it I tend to do it when speaking in a context I don't feel very comfortable in, usually in socially unfamiliar situations – maybe to release the physical pressure. I don't think it's necessarily something bad, but I will observe this in the future to identify situations where I am more doing it more in order to examine the reasons for this. My perception of being less relaxed than last time was also reflected in my behaviour, as I didn't sit down during discussion and stood up in a

similar position the entire time. I think the reason for this is because I was paying more attention to my body language and how I came across. Moreover, I noticed that my observer's feedback was true regarding my interactions with the group. I tended to focus on the students who were generally more approachable and talkative, therefore I stuck to with what I felt comfortable with. I think that my impression during the previous lecture about the group made me biased and led me to belief that certain people were easier to talk to or even more likable. The fact that they all sat on one side of the room next to each other reinforced my orientation towards them, and it subconsciously affected my interactions and my preference for these students. For future I should try to become more aware of these effects and aim to treat everyone the same by focussing onto more reserved and passive students, for example by asking directly for their opinion. I can actually relate to this, because I am a quiet learner within classrooms or bigger groups myself, so I should try to see the situation more from their side – maybe they did have many more interesting aspects and views to share but were reluctant because I wasn't actively engaging them.

In summary, this lecture was a valuable experience for me to put my theoretical knowledge base on a specific topic in health psychology into practice, allowing me to reflect and learn for upcoming opportunities to engage in more teaching. This experience has significantly contributed to the development and advancement of my skills. In the future, I will keep the learning theories that I applied in mind because I feel that they have helped me to balance the style and the concept of the delivery. In terms of my overall reflection and the students' and observer's feedback, I got a positive impression of my performance, and I feel that the flaws and gaps can be addressed quite easily as long as I keep working on them consciously in my next teaching opportunities. This experience has also taught me to be more relaxed and calm during the delivery, rather than trying to stick to my agenda rigorously. In the bigger picture, it's more important to respond to the audience based on their individual needs and inputs, rather than stressing about going through each and every slide exactly as I have planned.

I now feel that I am competent enough to deliver an effective lecture to students with advanced educational level, which is something I can definitely be proud of, and it is something that I couldn't have seen myself doing a few years ago.

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Appendix

1) Teaching plan
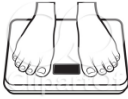
Time proposed	Subject/ Content	Activity	Resources/ Medium
10 am	Welcome and Introduction (introduce/ reintroduce self for those who attended previous lecture & pass registration form around to check attendance)	Exposition	Own notes & handouts for students
10:10am	Lecture agenda: Present learning objectives and outcomes: ● The challenge ● Causes ● Tackling through interventions ● Examples ● Future directions	Exposition	Power Point presentation & own notes
10:15am	**Taking a closer look at the challenge: Case examples & cross sectional studies** ● Illustrative case example to illustrate complexity of problem ● Initiative "Healthy shopping basket" ● Prevalence of overweight and obesity by year ● Overweight and obesity in children by school year	Exposition, Group discussion Q&A	Power Point presentation (including visuals and tables) & own notes
10:45am	**What causes Childhood obesity?** ● Availability of food ● Portion distortion ● Increase in portion size	Exposition & Q&A	Power Point presentation (incl. graphs & visuals) & own notes

	• Marketing directed at selling food to children • Family-related factors : parenting style, family interactions, feeding practice, normalisation of high weight, socioeconomic status, education, parents' weight • The contextual model of child obesity (Davidson & Birch, 2001)		
11:30am	**Break**	Meeting & allocating seat to observer, Reflection & Q&A	Be available for questions & making sure camera is recording

11:45pm	Group exercise:
	1.)Allocating students into 3 groups and asking them to imagine they are designing an intervention focussing on 3 different strategies to prevent childhood obesity
	    1. Standardisation of food labelling
	    2. Promoting healthy food options in a cinema
	    3. Cooking sessions with young parents on low income
	2.) Questions for students to discuss among their group, and then share with the whole audience:
	1. Behaviour and outcomes they are addressing
		Reflection & group discussion	Be available for questions and input to different discussions

	2. Stakeholders required for implementation 3. Expected constraints that may interfere with effectiveness		
12:15pm	**Selected intervention to tackle childhood obesity:** ● Concept of APPLES (Active programme promoting lifestyle in schools): Aim & target group ● Outline of different activities involved with examples	Exposition	Power point presentation, own notes
12:40pm	**Future directions:** ● Critical periods in development of obesity (Woodward-Lopez et al., 2006)	Exposition	Power point presentation, own notes
12:50pm	**Summary**	Exposition & Discussion	Power point presentation, own notes
12:55pm	**Feedback forms and Close**		Evaluation forms

2) Lecture slides:

Helena Wehling
18th February, 2016

CHILDHOOD OBESITY
Challenges and directions

www.clipartof.com - 1146474

AGENDA
- The challenge
- Causes
- Tackling through interventions
- Examples
- Future directions

TAKING A CLOSER LOOK AT THE CHALLENGE

It may be more complex than it seems...

HEALTHY SHOPPING BASKET

Council estates

- More expensive
- Limited availability
- Poor quality

Out of town supermarkets

- Cheaper
- More variety
- Better quality

PREVALENCE OF OVERWEIGHT AND OBESITY BY YEAR

	N	Mean age Yrs	Overweight %	Obese %
1996	613	8.39	17.5	8.9
1997	596	9.39	21.3	10.9
1998	577	10.35	25.5	13.9

OVERWEIGHT AND OBESITY IN CHILDREN BY SCHOOL YEAR

	2006-07	2007-08	2008-09	2009-11
Reception (aged 4-5 years)				
Overweight	13.0%	13.0%	13.2%	13.2%
Obese	9.9%	9.6%	9.6%	9.4%
Year 6 (aged 10-11 years)				
Overweight	14.2%	14.3%	14.3%	14.4%
Obese	17.5%	18.3%	18.3%	19%

Source: National Child Measurement Programme

WHAT CAUSES CHILDHOOD OBESITY?

AVAILABILITY OF FOOD

PORTION DISTORTION

88%
Took a larger amount
than the suggested
30g

44g
The average portion
served

PORTION DISTORTION

25%
thought this would
serve only one, and
not two persons as
per packet
recommendation

INCREASE IN PORTION SIZE

72g
280 kcl

1993:
average of 85g

130g
450kcl

Marketing directed at selling food to children

Family-related factors

- Parenting style
- Family interactions
- Feeding practice
- Normalisation of high weight
- Socioeconomic status & education
- Parent weight status

The Contextual model of child obesity (Davison & Birch, 2001)
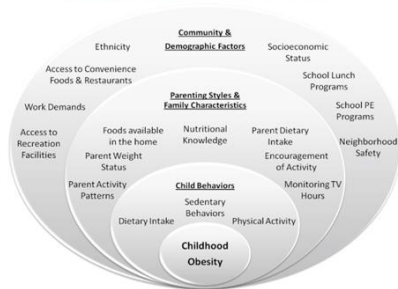
Group exercise

Imagine you were to conduct an intervention to prevent childhood obesity, tackling different risk factors...

1. Standardisation of food labelling in supermarkets
2. Promoting healthy food options in a cinema
3. Cooking sessions with young parents on low income

Think about the following aspects...

1. What behaviour are you addressing and what outcomes are you interested in?
2. What stakeholders need to be involved?
3. What constraints do you expect, that could impact on the effectiveness?

SELECTED INTERVENTION TO TACKLE CHILDHOOD OBESITY

APPLES (ACTIVE PROGRAMME PROMOTING LIFESTYLE IN SCHOOLS)

- Targeted children from 7 to 11 years in primary school (N= 600)

- **_Aim_**: To develop a school-based programme aiming to improve

  - Diet
  - Activity levels
  - Obesity levels

Health fairs

PE lessons

School meals

Playground activities

Cooking sessions

Tuck shops

FUTURE DIRECTIONS

CRITICAL PERIODS IN DEVELOPMENT OF OBESITY (WOODWARD-LOPEZ ET AL, 2006)

1. Intrauterine growth period (birth weight)
2. Infancy
3. Adiposity rebound
4. Early puberty
5. Postpartum
6. Menopause
7. Elderly

FUTURE DIRECTIONS

- Early prevention: ante-natal & post-natal
- Tailored to specific needs
- Empowering parents to be confident
- Reducing health inequalities
- Settings: community-based
- Involve target group
- Ongoing monitoring & evaluation

Feedback Form

Date:

Session:

Tutor:

Feedback

How do you rate this session:

Usefulness: 1   2   3   4   5   (1 poor, 5 excellent)

Content/relevance: 1   2   3   4   5

Teaching: 1   2   3   4   5

Overall: 1   2   3   4   5

Do you feel more confident on the subject? Yes/ No/ Unsure

How competent was the tutor?

1   2   3   4   5

Not competent at all   Extremely competent

How interesting did you find the presented content?

1   2   3   4   5

Not interesting at all   Extremely interesting

How confident did the tutor come across?

1   2   3   4   5

Not confident at all   Extremely confident

How engaging did you find this session?

1   2   3   4   5

Not engaging at all   Extremely engaging

What were the good points?

_____
_____
_____
_____

What could the tutor improve on for the future?

_____
_____
_____
_____

Any additional comments?

_____
_____

Many thanks for completing this feedback from, please return it to your tutor.

Competence 4.0

Consultancy assessment

Workplace health and wellbeing – Exploring drivers and effective interventions

Contents

Introduction

This assessment covers the consultancy undertaken during my stage two health psychology training, including the planning and development of a consultancy agreement that take into account professional and ethical considerations and reflection about the experience after completion of the project. The case study involves a literature review with the aim of identifying robust evidence for the elements and topics of an online intervention targeting health at the workplace, primarily targeted at new business owners, PhD students and entrepreneurs who are predominantly female adults.

Consultancy overview and development

The contact to the external client was established through London Metropolitan University. After I had been forwarded the contact details of the company owner, I established an initial contact with the manager via telephone in September 2015 to introduce myself and discuss the general possibility of delivering a consultancy, taking into account my background and professional experience I was able to offer. The client suggested a face to face meeting to give both of us a chance to get to know each other personally, to assess each others' expectations of an ideal working contract and to discuss potential work project that I could be involved in potentially. Based on this initial conversation we would then decide on the scope and nature of a suitable consultancy project. During our meeting the client provided a brief background of of her company, which she had only set up recently, and she introduced me to one of her major programmes she was in the process of scoping out at that point. This project was an intervention that aims to promote multiple drivers and barriers to workplace health and targets adult women, who are predominantly entrepreneurs, new business owners and PhD students. This population generally constitutes the main target group of the typical `clientele the company is dealing with. As the present intervention is still in its early pilot stages, we agreed to go ahead with my project in a few months after we have a better idea about where it can best fit within my university training. I was assured by the client that she was able to offer me sufficient flexibility regarding timelines and deadlines, since she

was aware of my other professional commitments, and also due to the voluntary nature of the contract. After we had several informal conversations over the phone to keep each other updated we agreed the starting date for the consultancy to be October 2016, as this would be a suitable time point for both of us. The client had developed the intervention material and I was in a position in my training where I was able to allocate time for completing the consultancy competence. We scheduled a skype call to discuss the background for the consultancy project, which is based on the WAKE UP online programme, a structured, module-based online intervention to improve workplace health. The types of topics covered in WAKE UP online mostly focus on mindfulness and meditation; how to move from living in auto-pilot to taking control; the power of our thoughts and dealing with your inner critic; vision building and manifestation; reaching outside of your comfort zone; wellbeing and success; and the money mindset needed for success.

With the programme being developed, the client needs to present a robust evidence base to inform the rationale of the concepts and elements that are part of the modules. Therefore, she needs to identify and review relevant existing literature looking at factors and interventions that are addressed within the programme. A literature review should attempt to understand how the content of the programme would be beneficial for the health and wellbeing of three audiences: 1) Senior leaders, executives and entrepreneurs 2) PhD students 3) Women aged 24 - 40 years old. The content of the literature review will be used to pitch potential clients who have an invested interest in the intervention rationale. We agreed on a total of roughly 40 hours of my time to spend on the literature search and report, but this could be slightly adapted if needed. The brief for the consultancy was clarified and specified in the phone call, and the client sent a follow-up as a summary email reiterating the background of the consultancy, which is the newly developed workplace intervention, and tasks required to undertake the work. Therefore, this consultancy consisted of performing a non-systematic literature review (All evidence for communication, including meeting minutes and emails can be found in the Consultancy log folder).

After reviewing the brief, I sent a follow up email with a consultancy plan detailing the inclusion and exclusion criteria of the studies, as well as the search strategy, including the databases I am going to use and a list of eligible search terms that I had identified as appropriate for the present topic (see appendix). The client shared the programme materials with me to give me the opportunity to familiarise myself with the basic concepts and programme materials, so that I will be able to carry out the review effectively and aligned with the key principles and contents of the intervention. The programme consists of eight separate reading modules discussing different aspects of wellbeing and health at work, including healthy eating, physical activity, mindfulness, beliefs, and meditation techniques. Each module follows a similar structure that incorporates intention setting techniques, goal setting and action planning. The intervention is being complimented through homework activities between each module as well as weekly skype sessions with the programme leader and the other participants. Following the preliminary meetings where the objectives and scope of the project were specified and agreed, a consultancy agreement was drafted by the client. The purpose of this document was to clearly outline and define my role as an external consultant, the requested outcomes, as well as stating the agreed time frame. I reviewed the contract prior to the implementation and returned it to the client. With the consultant and the consultancy requesting body singing the contract, this step formalised the consultancy by ensuring that both parties accepted the proposed conditions. After the formal aspects of the project being set in place, I conducted and preliminary database search to assess the scope and applicability of the agreed search strategy in order to assess its likelihood of achieving the defined outcomes, or whether the plan needed to be adjusted before proceeding with the full literature review. The search identified a high number of papers, including various seemingly relevant papers, after a first glance at the titles and abstracts. Based on this, I deemed the present consultancy plan as effective for producing the desired outcomes, which I also confirmed with the client. In terms of the output materials as a measure of whether the consultancy has been met, it was agreed that I would provide a standard research report, including an introduction, method, results and

conclusions. In addition to this, I would enclose all data collection tools as a reference to the literature I have included in this review. The client requested to receive this in the form of a spreadsheet, including the full reference list, a link to the full text if available, and a brief summary of the paper. In order to organise my findings more effectively into the different topics, I added a definition of the specific factor of workplace health that each study addresses, such as stress. While summarizing the papers, I attempted to focus on the link between the study and the purpose of the literature review by filtering the details that seemed relevant for the factors that were of interest for the consultancy. The spreadsheets can be found as supporting materials in the Consultancy log book.

Integration of consultancy and theory used

Based on my experience of conducting the external consultancy project and the particular working relationship I found myself in, I applied the principles and founding theories of two different consultancy models:

Intially I found that the process resembled a lot to the five phases of consultancy according Block et al. (2011), which describes a process that takes place in five sequential steps, going from entry and contracting in which the problem is being explored and expectations are being expressed, to discovery and dialogue, where methods and timelines are agreed. The next step consisted of the analysis and decision to act, which involved me planning the required steps and making amendments to the action plan, such as adding search terms and criteria. I then proceeded into the next phase referred to as Implementation and Engagement in which I maintained regular contact and reviews with the client while carrying out the previously agreed steps via emails and phone calls. This final step contained the termination and recycling of the project: Although our working relationship was officially ended, we kept the door open for any future collaborations. This phase also concluded into learnings from the experience, which for me were mostly the juggling of conflicting working relationships and commitments, and it taught me that it can be possible with a lot of determination, planning and openness to changes of the consultancy plan. This will be further elaborated in the Reflection chapter.

Another important aspect of this theory is the recognition of one's own feelings and style as important dimensions to the delivery of the consultancy. This means that skill in consulting is not only understood as providing a solution that responds to the client's needs, but also to identify and address issues around own needs and responsibilities. I felt that this was central for the functioning and progress in the context of this present project, as I had to deal with a lot of difficult challenges in my ongoing full-time placement that affected my physical and mental health, which made it extremely difficult for me to stick to the original timelines. For this reason, I had to take a step back which was fortunately well received and understood by the client and she granted me a lot of flexibility and trust that despite the push back of initially established timelines I would be able to deliver the results in my own time.

The second theory I took into account for the work process was the Seven C's of Consultancy by Cope (2010). According to this model consultancy is understood as a cycle of ongoing adapting, changes and progress with corresponding tools for each stage. It is assumed that consulting projects are like life – they are unpredictable and withhold surprises or unexpected changes around the corner, meaning that it doesn't usually follow a structured path, or one single correct way. The model is outlined with in the image below.
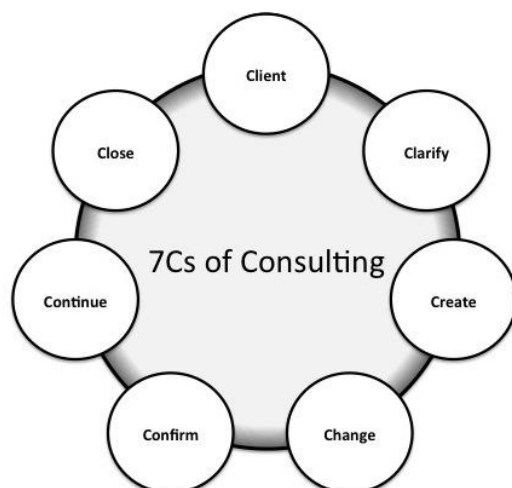
I felt that this model corresponded to the nature of the workflow that I adopted, because the plan underwent a lot of changes from being uncertain

in the beginning of meeting the client, where we both needed to find a common ground for the timeline and the nature of the project, which took a couple of months itself. However, once this was clarified, the progression into the consecutive stages felt quite natural as the project took on a more specific form with clear definition of outcomes and methods. When there were aspects or goals that needed refinement or adjustments, the cycle was being repeated.

Database research, review and report

After searching all databases as agreed per consultancy plan, I collated a summary of all relevant study that fulfilled the inclusion criteria into a spreadsheet, including the link of evidence to the WAKE UP programme by outlining the factor that was being addressed. After reviewing the extent of how the objectives of required literature had been met, I found that while I had been able to find a lot of evidence for generic terms and interventions such as lifestyle (e.g. physical activity and healthy eating), mindfulness and sleep, there were gaps in the search results in terms of more specific and less common factors, for example intention setting, value-based living or visualisation techniques. Therefore, I ran a more focussed search for each of those individual components, and found that sometimes I needed to dig a bit deeper into complex interventional studies to be able to identify the technique as part of a programme, as some of them are mostly considered as techniques that are usually incorporated into a wider therapeutic approach, for example Value-based Living, which forms a central principal of Acceptance Commitment Therapy (Maclean, 2013). With this strategy, I was able to find corresponding and relevant evidence for each factor apart from one construct, the "Five ways to wellbeing" which is based five central actions that form physical and mental health as a public initiative to promote wellbeing at work, including "Connect", "Be active", "Take notice", "Keep learning" and "Give" (Government UK, 2008). Although there is existing literature describing this model, there is scarce evidence for its application in the workplace context in order to evaluate its effectiveness and no published randomised controlled trial has explicitly incorporated its principles to date.

After summarizing and structuring the report by topic, I sent out the first draft to the client and stated the reason for the part of the consultancy not being met, as described above. The client gave me positive feedback about the review overall, emphasizing that this was exactly was she had expected and the factor with missing evidence was not an issue reflecting on any gaps in my review as I have addressed the key concepts in various other sections, such as physical activity and mindfulness. She asked me to change a few minor things, which were to provide the summary spreadsheet in alphabetical order, and to add two additional topics ("Life-long learning" and "Giving back – community volunteering"), which for some reason I had missed in our previous conversations. However, these changes were only minimal details, and after I submitted the updated document with the feedback incorporated our working relationship was officially terminated as all the agreed outcomes had been fully met and both sides were happy with the result.

Reflective-practitioner stance

I found that the type of work that I was doing for the consultancy resonated a lot with my previous experience in my everyday job role, as I am normally doing research-based tasks about 50% of the time, which involves plenty of reviews of evidence, either to conduct an actual literature review, or to identify robust evidence for our frameworks and models we are presenting to the client. Based on this, the consultancy combined precisely these two aspects, as I was reviewing literature with the purpose of creating a robust evidence base for an existing programme. Although I was initially disappointed about only implementing the consultancy at a rather late stage of my doctorate training following a long period of planning, looking back I believe that this was for a good reason. During the time I was waiting to start the project, I had the opportunity to gain various experiences in writing similar literature reports at work, and as a result I became relatively confident and familiar with the process, as I had a lot of support and feedback from senior colleagues who gave me constructive feedback and guided me in developing the crucial skills and know-how, such as referencing, using EndNote and how to put the findings into a context of a summarised insights report. Moreover, the systematic review I have written

in the course of my Stage 2 training had given me valuable training in terms of applying robust methodologic quality standards. I think if I had undertaken this particular consultancy at an earlier time, I definitely would have found this more challenging which would have meant spending more time and potentially producing a report with inferior quality. Moreover, the fact that I got very positive feedback proved to me that I am now in a good position to write literature reviews with sufficient and good quality standards.

From the perspective of my relationship and communication with the client, I was surprised in a positive way. From the beginning of the involvement with this particular client, I sensed her personal and warm approach, that didn't make it feel like a pure business relationship, but more like a friendship to me. As I am working for a bigger and very commercially-orientated company, this was a very different experience for me and I felt very comfortable in my interactions with her, as she clarified that she could be flexible around my other work and training commitments. All of this made the whole experience very pleasant and refreshing for me, as I had feared that working on an external project would lead to conflicts with my full-time job and I would struggle to accommodate both at the same time. The client's flexibility in terms of building the consultancy around my own needs taking into account my doctorate training and placement turned out to be extremely helpful, and made it much easier for me to accommodate and juggle both.

One aspect of the work I struggled with at a certain period was that the agreed timeline came at the worst timing in terms of my job situation – had just received a promotion and started working on a new challenging project with a lot of extra time being spent at work coming with added responsibility. As a result, the time I started working on the consultancy turned out to be a stressful couple of months that generally made it difficult for me to allocate any free time to my doctorate, to an extent that I was not able to foresee and plan any additional work in my free time. Therefore, I found myself forced to change timelines a couple of times. For this matter, the client flexibility proved to me a blessing for me, as my delays in the delivery fortunately did not have any impact on her work projects, neither

appeared this to cause any frustration or lack of trust in my reliability from her side. Taking into account the field of the research, this was definitely a novel learning experience for me as I was able to gain a deeper understanding of a topic which seemed to be more closely linked to the lifestyle behaviour domain than the focus of my day-to-day work, where I mostly deal with chronic disease management. On the other hand, it was interesting to tailor the evidence to a very specific target group, which definitely required an in-depth examination with the matter. While reading various studies I discovered the importance of tailoring interventions to gender, age, and cultural background of the target group, as this could impact on the overall approach factors that determine workplace wellbeing, such as the multiple roles women are typically expected to fulfil in various scenarios compared to men.

In terms of working with clients in general, I could fall back on various projects where I had been in direct contact with a client, therefore I felt very familiar with the process of corresponding and communicating with this customer. In conclusion of the whole experience, I have definitely learned to take on more workload and juggling with different projects in addition to my fulltime job. Another learning outcome to take away for me is that changing timelines and moving deadlines is not a sign of weakness or personal failure, but rather it can result in a valuable recognition of one's limitation and taking care of ones' own wellbeing, as long as there is sufficient transparency for the client and this is flagged to them in advance.

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<u>**Appendix**</u>

1) **Consultancy Project**

<u>**Literature review: Workplace health and wellbeing – Exploring drivers and effective interventions**</u>

1. Background

Today's work life consists of rapidly changing technology, globalization and many economic crises that causes the individuals to perceive higher level of job stress than before. The relation between job stress and employee well-being and health has been the subject of many studies that have supported the link between job stress and stressful working conditions and job quality (Çevik, 2011; Göçeri, 2014). The results revealed that job stress affects employees' physical and mental health directly and negatively, and is positively related to their job dissatisfaction, burnout, absenteeism, loss of production and performance, and high turnover rates.

Compared to the other job categories women entrepreneurs experience more stress in their career. One major source for this results from the increased role stress women entrepreneurs experience resulting from the multiple demands of managing professional and family life and the struggle of finding balance between these roles, which often leads to feelings of failure and disappointment if they are unable to meet these expectations (Ortqvist et. al, 2007; Subashini et al, 2016). There are additional demographic factors that can intensify perceived stress in women who are persuading an advanced professional career, which include single status, older age and African ethnicity (Arric et al, 2011).

A driving factor for general health is a health-promoting lifestyle at work which has associated benefits on wellbeing and work outcomes. Research shows that workers who engage in more health-promoting lifestyles perceive themselves as more competent, evaluated their health positively, and that professional women tend to have healthier lifestyle patterns. Additionally, the perception of health as internally controlled predicts a healthier lifestyle (Pender et al, 1990).

2. Methodology

The literature review will aim to gain a broad understanding of all the topics covered in the ▮▮▮▮▮▮ programme WAKE UP online. The types of topics covered in WAKE UP online include (but not exclusive to) mindfulness and meditation; how to move from living in auto-pilot to taking control; the power of our thoughts and dealing with your inner critic; vision building and

manifestation; reaching outside of your comfort zone; wellbeing and success; and the money mindset needed for success.

The literature review will attempt to understand how the content of the programme would be beneficial for the health and wellbeing of three audiences, if there is literature available around these groups: 1) Senior leaders, executives and entrepreneurs 2) PhD students 3) Women aged 24 - 40 years old. If there no evidence can be identified for any of the factors of interest, the search will explore these for different populations in the context of workplace. The content of the literature review will be used to pitch potential clients.

Between October 2016 and January 2017 the databases PubMed, PSYCInfo and Web of Science were searched for eligible studies. In the following step, a quick Google Scholar search was run to ensure that no relevant studies had been missed.

The following search terms were used to run the searches:

Step 1:

(diet* OR "healthy eating" OR "weight loss") AND (interven* OR programme OR support* OR manag* OR self-manag* OR improv* OR support*) AND (lifestyle OR "quality of life" OR wellbeing OR mindful* OR stress) AND (workplace OR student* OR entrepreneur* OR career* OR business* OR employee* OR worker*)

Step 2:

Add (digital OR online)

Additional considerations:

•   Studies should be from 2000 onwards

•   Studies should include adults only, preferably females

•   Studies should focus on populations from the UK, USA, Canada and the Caribbean

•   Intervention should have a duration of at least 6 months

3. Results

3.1.Factors associated with Health and Wellbeing at Work

Mindfulness and meditation

There is amounted evidence of the importance and effectiveness of incorporating mindfulness- and meditation-based techniques into everyday life for improving wellbeing with different populations of professionals that particularly highlight its usefulness in the context of targeting work-related stress. A clear advantage of meditation lies in the insight derived from a meta-analysis that this interventional component appears to be most popular compared to other intervention types, therefore its high acceptability identifies opportunities to apply this approach across general populations (Richardon & Rothstein, 2008). Harris (2014) tested a mindfulness-based intervention that was structured into 64 20-minute sessions and incorporated yoga, intention setting and gratitude exercises that support the positive effect of practicing mindfulness techniques on stress, burnout and wellbeing.

Findings from a study that explored strategies to prevent stress in solo entrepreneurs identified the positive effects of several techniques that revealed a high prevalence of actions derived from mindfulness, being in the nature, yoga, meditating, showers and taking a walk. The overall insights imply the following recommendations for stress reduction in this target group: (1)Identifying personal warning signs, (2)Stepping away from work daily or weekly to clear the mind, 3)Balancing the work, allowing both time alone and social contact, (4)Time-box tasks based on energy levels and mental capacity, not by urgency, (5) Embracing natural sleeping patterns, including segmented sleep (Barclay, 2015).

Sleep

A growing number of working women is reporting insufficient sleep, mostly as a result of long work hours and shifting circadian rhythms. The cost of this increasing trend holds many health and safety risks, including obesity, injuries, and negative reproductive outcomes. Over time, the worker is at risk for developing a wide range of chronic diseases. These work schedules can also strain personal relationships, owing to fatigue and poor mood from sleep deprivation and reduced quality time to spend with family and friends (Caruso, 2015).

A brief, economic mindfulness intervention was evaluated in its effectiveness with 140 employees in the context of the recovery process from work. The self-train intervention built upon key elements of Mindful-based CBT : after receiving general information about mindfulness along , the training consisted of daily guided mindfulness meditations and informal exercises via audio and written instructions. Following practices were reinforced: The Body Scan, the Three-Minute Breathing Space, the Mindful Routine Activity Exercise and a Loving Kindness Meditation exercise. As an essential part of mindfulness trainings, participants were encouraged to develop an open and compassionate mindset in performing all of these exercises. Findings revealed positive effects on sleep quality and duration but not on psychological detachment (Hülsheger et al, 2015).

Exercising, physical activity, mindful movement, walking

Programmes that target physical activity have the potential to effectively improve health outcomes that are associated with lifestyle-related conditions such as cardiovascular heart disease and diabetes risk. In this context, a lifestyle intervention programme that incorporated 12 weekly face-to-face lifestyle coaching sessions delivered at the worksite during the lunch hour, an optional DVD version of the programme coupled with monthly group meetings led to significant weight loss and improvement in physical activity, as well as risk factors for chronic conditions. The participants were supported through the provision of tools to facilitate their lifestyle behaviours, such as handouts, fat and calorie counters, self-monitoring logs, a pedometer and exercise bands (Kramer et al, 2015).

A different intervention underpinned by the socio-ecological model (SEM), which suggests targeting individual-, social-, organisational- and environmental-levels was tested with UK-based university staff with the aim to cut down sedentary time during work. The four week intervention included multimodal techniques, such as the use of reminder software, prompts via weekly emails and posters with "top tips" or links to educational videos , as well as face to face groups sessions, management support (standing or walking meetings) and environmental restructuring (e.g. prompts to use a different printer or have lunch in a different location). The intervention led to a significant reduction in sitting of 26 ± 54 min/workday that lasted beyond the time of the intervention (Mackenzie et al, 2015).

The results from a strength training programme suggests that in order to facilitate exercise behaviour attention should be given to the interaction between the management, the employees, as the main barrier to compliance was identified as the internal working culture, mainly resulting from perceived lack of acceptance and support by the management or co-workers. These insights highlight the the following motivational drivers to attend physical activity: (1) flexibility in the working day, (2) support from leading authorities, (3) daily communication with exercise groups (Bredahl et al, 2015).

During a counselling programme that aimed to increase physical activity the implementation of behaviour change techniques in combination with booster telephone calls by a nurse practitioner proved to be supportive. The intervention was tailored to each participating woman's individual exercise level and behaviour based which were determined during individual assessment and counselling sessions. The participants were able to increase the amount of weekend physical activity as well as minutes walked for exercise, on errands, total walking, and total daily blocks walked following the intervention (Purath et al, 2004).

Journaling

The empowering impact of journaling as a way to promote wellbeing and professional outcomes could be demonstrated in an intervention for workplace health promotion. Employees were asked to keep a journal, log, or diary of the stressful events in his or her life (cf. Alford, Malouff, & Osland, 2005). The journal was used as a means of assisting the employee to monitor stress levels, to identify the recurring causes of stress, and to note individuals' reactions. Based on this, action plans for managing stress were formulated. Specific outcomes could be observed in multiple domains: There was a significant improvement for psychological wellbeing, including reduced stress, anxiety, improved general health and job satisfaction. Additionally, using a journal was associated with improved blood pressure and work productivity (Goldgruber & Ahrens, 2010).

Using specific journaling approaches, in the case gratitude journaling, has been associated with a decrease in stress, having a calming effect, and improved ability to relax, while increasing the focus and performance in classes in university students (Flinchbaugh et al, 2011).

Gratitude

Gratitude is another crucial factor that has been linked to positive health outcomes in the work context. By experiencing and expressing gratitude individuals tend to experience more positive emotions, which can reverberate in other members of the organization and fuel optimal organisational functioning and helping businesses to thrive (Giacalone et al, 2003).

Bringing the attention to thankful events in work could reduce stress and depressive symptoms based on a trial with practitioners who were asked to complete diaries twice a week for one month. The type of events reported most frequently included practical assistance from mentor, good relationships with colleagues, and not having a busy day. The outcomes highlight that completing the diary exercise only twice a week have significant benefits for wellbeing, such as lowering stress and depression levels. Moreover, feeling support and socially embedded at work can be associated with the experience of gratitude (Cheng et al, 2015).

Additional meaningful insights imply the effectiveness of using gratitude journal as little as once weekly for increasing physical activity and exercise behaviour, reduced physical symptoms, improved general wellbeing and higher optimism regarding upcoming workload. Increasing the frequency of recording grateful events on a daily basis can result in increased alertness, determination, attentiveness, energy and altruistic behaviours (Giacalone et al, 2003).

Overall, these findings suggest that daily reflection and writing about grateful aspects of everyday work life is an effective strategy for producing pleasant affect and enhancing emotional wellbeing.

Intention setting

An intervention consisting of weekly structured sessions, which were mainly based on yoga and mindfulness and incorporated intention setting (e.g. by setting an intention before each work day), had a positive effect on mindfulness, emotional functioning, stress management, burnout as well as self-reported general wellbeing in a population of educators. This suggests that the use of volitional control via setting specific intentions plays a substantial role in supporting work wellbeing (Harris, 2014).

Daily routines and scheduling

Performing rituals as part of a regular activity that forms a routine, such as going to work every day, can have power of workers in general, either positively or negatively. The positive side of looking as having a routine in the context of work is its capacity of connecting people to something larger than themselves, something they feel part of that could add meaning to life (Giacalone et al, 2010). Moreover, the value of a routine at work can be suggested based on the association with several factors, including a healthier lifestyle, higher self-esteem, an increased sense of control, higher activity levels and energy, better resourcing management as well as more effective coping with major life challenges (Zisberg et al, 2007).

Attitudes, thoughts and beliefs

Many people seek not only competence and mastery in their work, but also to do work that has some social meaning or social value. One dimension of this is to feel part of a larger community or to be interconnected, therefore having good social relations through work is an important source of job satisfaction and wellbeing. Another important domain of what people value at work is integrating their personal life and work, stressing a need to be able to express themselves at work tasks by involving parts of their selves, rather than being entirely rational and detached from their emotions during work. The meaning of personal beliefs cannot be highlighted sufficiently, as it has been demonstrated that a person-role conflict (e.g. between being a good parent and being a good employee), that occurs when people's work roles require them to do and be things that are inconsistent with their personal beliefs and attitudes. This message contradicts people's desire for self-enhancement and their drive to maintain self-esteem, and can be destructive in that it denies the value of people as they are, and compelling them to behave in ways that are different from their essential nature (Giacalone et al, 2003).

Evidence stresses that work-related strivings and the personal meaning plays a crucial part in wellbeing with workers. Workers from a wide range of

professions who characterize their work as a "calling" rather than a job report less absenteeism than those who depict their work as a job or career. As the meanings of work takes on a meaningful character, people will invest greater resources such as time and energy toward work-related goals. Additional benefits of the sacred meaning of work include better life satisfaction, emotional wellbeing and sustained commitment (Giacalone et al, 2010).

Furthermore, a sense of coherence concerning family and business demands is highly associated with wellbeing in women entrepreneurs, accounting for 40-60% of the variance in quality of life. Given this insight, evoking a sense of coherence during work may be an important intervention target (Murry, 2002).

Attitudes, thoughts and beliefs around money

The importance of money in the management research is clear, as it is a prime factor in the foundation of a commerce and starting a business. From the economic perspective, money is viewed as a utilitarian commodity that is impersonal and mundane (Mitchell & Mickel, 1999). There is a curious lack of relationship between money and happiness, which is believed to be highly dependent on each person. It is believed that the individual attitude towards money is highly influenced by the motivation of the work. It is suggested that income obtained from work that is not the source of intrinsic delight is profane, whereas money derived from one's passion can be more valued. (Giacalone et al, 2003). An interesting point emerges from the research indicating that people are initially concerned with their absolute income, but at higher levels of pay, relative comparisons and equality become major determinants of pay satisfaction.

Individual differences have been identified around the importance and attractiveness of high pay in different people, suggesting that predominantly materialistic people prefer high pay, whereas risk-averse people prefer receiving a fixed payment. This implies the idea that people's attitudes and values should be matched with the job and organisation to ensure a good "fit", for example risk-averse people would probably not be comfortable with starting a new business where they have low predictability of the financial outcome (Mitchell & Mickel, 1999).

Value-based living

Value-based living forms a central principle of Acceptance Commitment Therapy (ACT), which is a mindfulness-based approach that teaches the ability to define and explore values, and to engage in actions that are consistent with those values. In an ACT-based intervention amongst mental health workers that was delivered in a group format over 3 sessions accompanied by homework assignments, handouts and DVDs, the positive

effect of practicing value-based living on several outcomes was demonstrated, including reduced stress, improved mental health, work engagement as well as for therapy-specific outcomes, i.e. value-based living and psychological flexibility (Maclean 2013).

Visualisation

A work-based intervention amongst nurses and midwives has demonstrated how visualisation can be a powerful tool in the context of improving personal resilience in the workplace through fostering creative expression of themselves in the context of their work environment, engaging with self-awareness and concepts of the self along the lifespan, as well as an encouraging view of the future. This exercise was implemented by asking the participants to draw their past self in comparison with their future self into different circles.

The outcomes reflect that visualisation techniques can be used to facilitate engagement with personal resilience characteristics such as positive, supportive relationships and networks, self-reflection, self-care, assertive communication and conflict resolution (McDonald et al, 2012).

Fear

The leap of faith surrounding the entrepreneurial process can cause uncertainty and sometimes fear. During the journey, they might have to deal with fears of losing a client, financial loss, not delivering on time, out of control cash flow, as well as the stress of not having enough time to spend with family, friends and loved ones.

In the context of work motivation, fear can motivate an increase in engagement with tasks, but on the other hand withdrawal from it as well. This can impact on how individuals respond to negative performance feedback and small setbacks in their career. The existing literature reveals a clear dichotomy with significantly more focus on fear as a trait rather than a temporary state. However in order to promote the idea that fear can be overcome, it may be more useful to frame it as an temporal cognitive and emotional experience in the centre of various influencing factors that can be targeted individually. Fear in the context of entrepreneurship is still a complex, understudied area that requires future research (Caccioti & Hayton, 2015).

Self-love, kindness and compassion

A well-known meditation technique derived from Acceptance Commitment Therapy focusses on applying the principles of compassion, friendliness, and loving-acceptance, called self-love kindness meditation (LKM) There is evidence for the positive impact of practicing LKM on the experience of emotional wellbeing, derived from insights from daily workshop sessions mostly run with women over 9 weeks. Regular practice of LKM resulted in improvements in multiple domains. The participants reported increased rates

of joy, gratitude, contentment, hope, pride and interest. However, these emotions took time to develop, which is likely to be due to the initial unfamiliarity with the practice and absence of immediate benefits. Furthermore, additional outcomes over time, resulting from the positive emotions, were observed for mindful attention, self-acceptance, improved relations with others, better physical health and fewer depressive symptoms (Fredrickson et al, 2008).

Social networks and peer groups

The role of social support in relation to positive health outcomes in the professional context has been investigated by various researchers. Findings highlight that perceived social support has a reducing effect on job stress, and this link is significantly higher in female entrepreneurs than in male entrepreneurs (Semerci, 2016). Furthermore, social support appears to have a moderating effect on depression caused by stress (Lin et al, 2010). On the other hand, long working hours in working women can have detrimental effects on personal relationships, owing to fatigue and poor mood from sleep deprivation and reduced quality time spent with family and friends. Fostering good co-worker and supervisor relationships has shown to have a protective effect against this (Caruso et al, 2015). Harris (201) furthermore identified accessing social and professional support networks as an effective strategy for stress management in solo entrepreneurs.

These insights suggest that rendering and building social networks and educating people in seeking and providing support, for example via team building activities, could help diminish negative effects of job stress and depression in organisations and businesses (Semerci, 2016; Lin et al, 2010).

Giving back - Community volunteering and helping others

A literature review suggests that community volunteering may be linked to positive effects on three dimensions of wellbeing: hedonic (e.g. positive mood), eudemonic (e.g. purpose in life) and social (e.g. feeling of belonging to the community), although the number of hours contributed appear to make no difference. These results align with the Role Identity Theory, which argues that wellbeing is fostered by having a stable and coherent sense of who we are and where we belong. Activities that are institutionalised in a socially valued role, as is volunteer work, therefore strengthens one's personal and social identity (Son & Wilson, 2012).

Regarding altruistic behaviour in everyday workplace practice, one study found that although people have personal perspectives and philosophies that embrace spiritual and altruistic principles, the environmental pressures of the workplace can be so overwhelming that they result in people's inability to enact compassionate care that was in alignment with their own personal and professional principles and ethics. A spiritually-based programme was implemented in a population of nurses with the aim of improving daily functioning with an emphasis of promoting communicate care that aligned with personal and professional ethics. The activities contained meditative

tools, such as training the senses and slowing down, priority setting and attention focus, overcoming conditioned habits, spending time with others and inspirational reading tasks. The programme was successful at enhancing communication and empathy, particularly the ability to see others' point of views and moving individuals from ego transactions to transpersonal transactions (Richards et al., 2006).

Ongoing life-long learning / personal and professional development

Explanations of individuals' learning for and throughout working life have shifted away from a focus on workplace interventions, as in training, to a more holistic and personal development. Central mechanisms involve the role of individuals' engagement in and construction of knowledge and skills. Increasingly, lifelong learning is seen as process in which personal factors shape the professional development. Subjectivity is crucial for meaningful life-long learning, and this concept underlies four accounts of self that are engaged in ongoing learning. The Autonomous Self stands for freedom of realising one's goals with spontaneous expression of oneself, while the subjugated self is embedded in social structures. The Enterprising Self is the entrepreneurial component that strives for individual formatting and maintaining identity, while seeking a fit between personal and professional goals. The Agentic Self holds that the self is able to both selectively engage and negotiate with the social suggestion that is directed by the individuals' intentions to secure, develop, and maintain their identity and ontological trajectory. What these different accounts of self suggest is that lifelong learning has distinct purposes and processes. The mobilisation of these selves, if it is done in an integrated manner, will not be directed just to reflect government and employer's goals, but rather the individual's interests through negotiation (Billet, 2010).

An in-depth field study with practitioners revealed that participation in lifelong learning has effects upon a range of health outcomes; well-being, protection and recovery from mental health difficulties, and the capacity to cope with potentially stress-inducing circumstances including the onset and progression of chronic illness and disability. Moreover, this type of learning may contribute to developing positive psychosocial qualities, such as self-esteem, self-efficacy, a sense of purpose and hope, competences and social integration. However, to achieve these outcomes it is important that the educational experience matches the interests, strengths and needs of the learner, which mostly depend on the stage in their life course (Hammond, 2004).

3.2.Interventions for Health and Wellbeing at Work

Cognitive Behavioural Therapy

A meta-analysis showed that across different types of interventions to improve stress management at work Cognitive-behavioural programmes tend to be most effective (Richardson & Rothstein, 2008).

Moreover, the results of a CBT-derived intervention suggest the effectiveness of this therapy for self-employed people: The study compared two different approaches, the first one consisting on extensive CBT conducted by psychotherapist (focussing on cognitive restructuring and registration of symptoms, as well as work resumption, time management, conflict handling and fatigue). The second intervention combined individual-focused with workplace interventions. Participants received psycho-education on work stress, registration of symptoms and situations, relaxation, self-help books, time-management and writing assignments.

The combined intervention proved to be associated with higher return to work rates, and both interventions were associated with decreases in psychological complaints, including anxiety, depression, and burnout (Blonk et al, 2006).

Digital and telephone-based interventions

Another group of interventions that has found increasing popularity after the rise of modern technology over the last decade are digital interventions that are delivered via the internet. A randomised controlled trial aimed to evaluate the efficacy of a self-guided internet-based stress management intervention for employees compared to a 6-month wait-list control group. The intervention included seven sessions and one booster session including problem-solving and emotion regulation techniques. The outcomes suggest that these online modules were successful in improving mental wellbeing (including depression, anxiety, emotional exhaustion, psychological detachment, worrying, emotion regulation skills & mental health-related quality of life), as well as physical health (sleep quality). An interesting finding was that at the 6-month follow-up, all outcomes remained significantly better with the exception of work engagement, physical health-related quality of life and absenteeism (Ebert et al, 2016).

Delivering an intervention via telephone can be another cost-effective way to deliver individual, tailored counselling for changing lifestyle behaviours, such as exercise and healthy eating. The appropriateness of this approach was tested with young adult obese postgraduate university students who participated in telephone sessions that were run by coaches that supported individual goals through dialogues, using elements informed by Motivational Interviewing (MI). The sessions lasted for 12 weeks with 30-50 minutes each. The participants were encouraged to arrange the sessions by themselves proactively, therefore reinforcing self-responsibility. A second arm of the intervention (LEARN) entailed structured educational telephone sessions on lifestyle, exercise, attitudes, relationships and nutrition. The learning outcomes stressed practical application of knowledge around stimulus control, problem solving, goals setting and cognitive restructuring sessions. The participants were encouraged to personalise recommendations

through behaviour change techniques, such as self-monitoring of food intake. In contrast to the MI group, the LEARN group received scheduled calls from their coaches. Both interventions suggest that telephone-based counselling that is tailored to the individual and reinforces guided goal setting or self-responsibility produce positive effects on quality of life, however the LEARN group was more effective in weight reduction. These findings suggest that both choices (MI and LEARN) should be made available based on differential learning styles (independent vs. guided) (Pearson et al, 2012).

4. Conclusions

Based on the insights derived from the reviewed literature, the following conclusions can be drawn for the context of designing effective and robust intervention targeting health and wellbeing for the target audiences of the WAKE UP programme:

•   Mindfulness- and meditation-based elements, inspired by ACT, LKM, yoga and gratitude exercises, are particularly effective in reducing work-related stress (Harris, 2014; Barclay et al, 2015; Maclean, 2013; Frederickson 2008)

•   Educational sessions are more impactful when they are incorporated into daily work routine to encourage and facilitate consistent engagement (Kramer et al, 2015)

•   Promoting the experience and awareness of grateful events lowers stress and improves mood, but an also contribute to improving lifestyle, such as exercise behaviour. An effective technique to promote gratitude is journaling (Cheng et al, 2015)

•   Cognitive-Behavioural programmes appear to produce the largest effect in the context of stress management in the workplace, suggestion that work-based wellbeing interventions should incorporate elements of this approach (Richardson & Rothstein, 2008)

•   Remaining aware and in contact with situations that are present at work, and to keep track personally chosen values in their behaviour can improve functioning and health at work (Maclean, 2013)

•   Accompanying material, such as written handouts and homework assignments, reinforce the learnings and maintain the changes in different types of interventions (Maclean, 2013)

•   The combination of different behaviour change techniques (e.g. prompting and social support) and delivery channels (digital reminder, face to face session, visually presented information); and additionally tailoring the programme to the individual appears to be effective for reinforcing lifestyle changes, such as exercising or healthy eating (Mackenzie et al, 2015; Purath et al, 2004; Bredahl et al; 2015).

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2) Consultancy brief

You shall use your best endeavours to promote the interests of the Client.

You shall carry out a scope of the literature for the Client covering a broad understanding of all the topics covered in the ▮▮▮▮▮▮ programme WAKE UP online. The types of topics covered in WAKE UP online include (but not exclusive to) mindfulness and meditation; how to move from living in auto-pilot to taking control; the power of our thoughts and dealing with your inner critic; vision building and manifestation; reaching outside of your comfort zone; wellbeing and success; and the money mindset needed for success.

The literature review will attempt to understand how the content of the programme would be beneficial for the health and wellbeing of three audiences: 1) Senior leaders, executives and entrepreneurs 2) PhD students 3) Women aged 24 - 40 years old. The content of the literature review will be used to pitch potential clients.

3) Consultancy Plan

Search terms:

Step 1:

(diet* OR "healthy eating" OR "weight loss") AND (interven* OR programme OR support* OR manag* OR self-manag* OR improv* OR support*) AND (lifestyle OR "quality of life" OR wellbeing OR mindful* OR stress) AND (workplace OR student* OR entrepreneur* OR career* OR business* OR employee* OR worker*)

Step 2:

Add (digital OR online)

Additional considerations:

- Studies should be from 2000 onwards

- Studies should include adults only, preferably females

- Studies should focus on populations from the UK, USA, Canada and the Caribbean

- Intervention should have a duration of at least 6 months

4) Consultancy Agreement

████████████████████████

████████████████████████

██████

████████

Helena Wehling

██████████████████████████████████

_____

12th October 2016

Dear Helena,

Consultancy agreement

We are writing to confirm the terms of our agreement concerning the provision of your consultancy services to ████████████████████
████████ (Client).

1. TERM

You shall provide your services to the Client from 13th October 2016 until the project is completed.

2. DUTIES

2.1   You shall use your best endeavours to promote the interests of the Client. You shall carry out a scope of the literature for the Client covering a broad understanding of all the topics covered in the █████████ programme WAKE UP online. The literature review will attempt to understand how the content of the programme would be beneficial for the health and wellbeing of three audiences:

1) Senior leaders, executives and entrepreneurs 2) PhD students 3) Women aged

24 - 40 years old. The content of the literature review will be used to pitch potential clients.

2.2 If you are unable to provide the Services due to illness or injury you shall notify █████████ as soon as reasonably practicable.

2.3   You have no authority (and shall not hold yourself out as having authority) to bind the Client, unless we have specifically permitted this in writing in advance.

2.4   You must comply with the Bribery Act 2010. Failure to do so may result in the immediate termination of this agreement.

3. FEES AND EXPENSES

3.1 You agree that this consultancy project is unpaid.

4. CONFIDENTIAL INFORMATION AND CLIENT PROPERTY

4.1   You shall not use or disclose to any person either during or at any time after your engagement by the Client any confidential information about the business or affairs of the Client or any other company in its group or any of its business contacts, or about any other confidential matters   which may come to your knowledge in the course of providing the Services. For the purposes of this clause

4, confidential information means any information or matter which is not in the public domain and which relates to the affairs of the Client or any other company in its group or any of its or their business contacts.

4.2 The restriction in clause 4.1 does not apply to:

(a) any use or disclosure authorised by the Client or as required by law; or

(b) any information which is already in, or comes into, the public domain otherwise than through your unauthorised disclosure.

4.3   All documents, manuals, hardware and software provided for your use by the Client, and any data or documents (including copies) produced, maintained or stored on the Client's computer systems or other electronic equipment (including mobile phones if provided by the Client), remain the property of the Client.

5. INTELLECTUAL PROPERTY

5.1 For the purposes of this Clause 5 the following definitions apply:

Intellectual Property Rights: patents, rights to Inventions, copyright and related rights, trade marks, business names and domain names, rights in get-up, goodwill and the right to sue for passing off or unfair competition, rights in designs, database rights, rights to use, and protect the confidentiality of,

confidential information (including know-how and trade secrets) and all other intellectual property rights, in each case whether registered or unregistered and including all applications and rights to apply for and be granted, renewals or extensions of, and rights to claim priority from, such rights and all similar or equivalent rights or forms of protection which subsist or will subsist now or in the future in any part of the world.

Invention: any invention, idea, discovery, development, improvement or innovation made by You in the provision of the Services, whether or not patentable or capable of registration, and whether or not recorded in any medium.

5.2 You hereby assign to the Client all existing and future Intellectual Property Rights and Inventions arising from the Services you provide for the Client. You agree promptly to execute all documents and do all acts as may, in the opinion of the Client, be necessary to give effect to this clause 7. Insofar as they do not vest automatically by operation of law or under this agreement, you hold legal title in these rights and inventions on trust for the Client.

5.3 You undertake:

(a) to notify to the Client in writing full details of any Inventions promptly on their creation;

(b) to keep confidential details of all Inventions;

(c) whenever requested to do so by the Client and in any event on the termination of the Engagement, promptly to deliver to the Client all correspondence, documents, papers and records on all media (and all copies or abstracts of them), or recording which were prepared by you in the provision of the Services and the process of their creation which are in your possession, custody or power;

(d) not to register nor attempt to register any of the Intellectual Property Rights which arose as a result of the Services provided by you to the Client, nor any of the Inventions, unless requested to do so by the Client; and

(e) to do all acts necessary to confirm that absolute title in all Intellectual Property Rights arising as a result of the Services provided by you and the Inventions has passed, or will pass, to the Client.

5.4   You hereby irrevocably waive all moral rights under the Copyright, Designs and Patents Act 1988 (and all similar rights in other jurisdictions) which you have or will have in any existing or future works.

5.5   You agree to indemnify the Client and keep it indemnified at all times against all or any costs, claims, damages or expenses incurred by the Client, or for which the Client may become liable, with respect to any intellectual property infringement claim or other claim relating to the Services supplied by you to the Client during the term of this Agreement. The Client may at its option satisfy this indemnity (in whole or in part) by way of deduction from any payments due to you.

6. INSURANCE AND LIABILITY

You shall have personal liability for and shall indemnify the Client and any other company in its group for any loss, liability, costs (including reasonable legal costs), damages or expenses arising from the provision of the Services and shall maintain in force during the period of this agreement adequate insurance cover with reputable insurers acceptable to the Client.

7. TERMINATION

The Client may at any time terminate your engagement with immediate effect if:

(a)   you are in material breach of any of your obligations under this agreement; or

(b)   other than as a result of illness or accident, after notice in writing, you wilfully neglect to provide or fail to remedy any default in providing the Services.

Any delay by the Client in exercising its rights to terminate shall not constitute a waiver of those rights.

8. OBLIGATIONS ON TERMINATION

Any Client property in your possession and any original or copy documents obtained by you in the course of providing the Services shall be returned to Tilean Clarke at any time on request   and in any event on or before the termination of this agreement. You also undertake to irretrievably delete any information relating to the business of the Client or any other company in its group stored on any magnetic or optical disk or memory, and all matter derived from such sources which is in your possession or under your control outside the premises of the Client.

9. STATUS

9.1   You will be an independent contractor and nothing in this agreement shall render you an employee, worker, agent or partner of the Client and you shall not hold yourself out as such.

9.2   You shall be fully responsible for and indemnify the Client against any liability, assessment or claim for:

(a)   taxation whatsoever arising from or made in connection with the performance of the Services, where such recovery is not prohibited by law; and

(b)   any employment-related claim or any claim based on worker status (including reasonable costs and expenses) brought by you against the Client arising out of or in connection with the provision of the Services.

The Client may satisfy such indemnity (in whole or in part) by way of deduction from any payment due to you.

10. VARIATION

This agreement may only be varied by a document signed by both you and the
Client.

11. THIRD PARTY RIGHTS

The Contracts (Rights of Third Parties) Act 1999 shall not apply to this agreement and no person other than you and the Client shall have any rights

under it. The terms of this agreement or any of them may be varied, amended or modified or this agreement may be suspended, cancelled or terminated by agreement in writing between the parties or this agreement may be rescinded (in each case), without the consent of any third party.

12. GOVERNING LAW

This agreement and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and construed in accordance with the law of England and Wales.

13. JURISDICTION

The courts of England and Wales shall have exclusive jurisdiction to settle any dispute or claim arising out of or in connection with this agreement or its subject matter or formation (including non-contractual disputes or claims).

Please acknowledge receipt of this letter and acceptance of its terms by signing, dating and returning the enclosed copy.

Yours sincerely,

I hereby acknowledge receipt and accept the contents of this letter.

Helena Wehling

Signed ....

[CONSULTANT]

Date ....

Signature:

Email:

Helena Wehling (Oct 27, 2016)

Signature:

Competence 1.0

Professional Skills Assessment

Contents

<u>Introduction</u>

This report outlines my professional development as a health psychologist during the two-year completion period of my training on the professional doctorate programme and serves as the basis for the assessment of the Professional Skills competency. Reflective commentaries are provided demonstrating how I met each aspect of this competence.

1. Core units of Generic Professional Skills Competency

1.1.<u>Professional autonomy & accountability</u>

1.1a Practice within the legal ethical boundaries

At the beginning of my training I ensured that I was familiar with the professional and ethical guidelines detailed by the British Psychological Societies standards (Ethics Committee of the British Psychological Society, 2009) and the Health and Care Professions Council standards (Health and Care Professions Council, 2015). I referred to both documents from time to time in order to confirm I was practicing correctly in line with the codes of conduct within my professional role and regularly reviewed specific points when I was in doubt. I attended a HCPC Regulation workshop half way through my training in 2016, which was organised by the British Psychological Society. This helped me become more confident in regards to being able to critically reflect upon the codes and become aware of potentially critical scenarios, such as breach of confidentiality.

My job role as a health professional dealing with pharmaceutical products in the wider context required additional legal aspects I was required to follow consistently: Firstly, the mandatory training that each staff member was required to complete annually involved the Code of Practice for the Pharmaceutical Industry run by the Prescription Medicines Code of Practice Authority (PMCPA) to ensure compliance with the codes. Additionally, with my job involving field research with patients and health care professionals, I regularly underwent training by the British Healthcare Business Intelligence (BHBIA) in Adverse Event reporting for market research and the Legal and Ethical Guidelines for Healthcare Market Research for general guidance. In

addition to this, each pharmaceutical company has their own specific rules and legal implications in how they deal with legal aspects, including adverse events occurring in their own products. This meant that in addition to the general BHBIA training I needed to adhere with these codes when working for different clients, which was provided through appropriate training prior to the start of the research project phase. This formality became practically relevant when I was made aware of side effects by a patient or healthcare professional, and equipped with correct action steps as a response to these situations by reporting the personal details in line with the company-specific guidelines.

Throughout my years in my training I also had the chance to gain multifaceted experience in handling sensitive personal information, both in my placement and as part of my doctorate thesis. Analysing qualitative interviews required applying the principles of confidentiality and anonymity conscientiously when dealing with the transcripts and audio recordings. I made sure to obtain participants' consent prior to the research in regards to the use of their data and their rights.

There were definitely some major learnings for me in regards to facilitating consent procedures correctly throughout my time in my job, when I was the leading a hospital-based research project with healthcare professionals in Austria at a stage when I was still relatively new to the training. With the administrative process surrounding the employer's consent usually being the responsibility of the project management team in my company, I was faced with difficulties when I found out that this had not been organised on-site and I was close to breaching a critical code without my awareness. This incident taught me that I should not exclusively rely on others and assume they are doing their job correctly, but I need to look out for potential constraints that may fall on my behalf, although not considered as part of my role definition. I definitely lacked in adequate knowledge and confidence in this particularly critical situation, which made it challenging for me proceed adequately and promptly. The positive learning from this incident for me was that am acting with a lot more caution and foresight than before, especially in sensitive environments like hospital or clinics. This new

awareness about varying legal regulations in different countries encouraged me to additionally refer to the EphMRA Codes of Conduct (European Pharmaceutical Market Research Association, 2017) when planning my research projects, and also to seek senior professional guidance in my team increasingly beforehand.

Throughout my time in my placement I was involved in the design of patient-targeted materials to support their disease and treatment self-management as part of a targeted behaviour change intervention, referred to as 'patient support programme'. The intervention usually consisted of telephone call scripts to be used by nurses with the patient, discussion guides for healthcare professionals in clinics, patient-targeted websites, magazines or digital messages communicated via Email or SMS. As the majority of the patient populations were affected by chronic conditions, it was important for me to be conscious about the fact that these people have often lived experience with this disease over many years, sometimes since their birth, therefore they often become experts for their own illness. Receiving advice from a professional, who is a stranger and has not lived with this disease, therefore may feel patronizing and impersonal for some patients, creating a potential barrier for optimal engagement with the programme. This power imbalance can be overcome by careful use of language (e.g. "person with X disease" instead of "patient") and intensive, repeated concept testing with the target population throughout the development process, as well as thorough and continuous evaluation of feedback. To implement these practices, I collaborated with an editor from a medical journalism background who reviewed the content to ensure that the language was patient-friendly and appropriate. Furthermore, the research process surrounding the design and conceptualization of the interventions included a concept testing phase inspired by a participatory research approach (Bergold & Thomas, 2012). This contributed to shaping the programme in response to actual patient needs and priorities to ensure that they adequately address their self-management behaviours based on their actual needs and preferences.

1.1b Practice as an autonomous professional

Having undergone two years with two professional full time commitments, including the full-time doctorate training and my full-time work placement, has immensely helped me grow as an autonomous professional. While it was challenging at times, it has equipped me with time management skills and the ability to deliver outputs with a high workload under time pressure, while still maintaining a high work quality.

For the majority of my training period my job role sat within the clinical team of an agency that specialises in the design and implementation of interventions aimed at clients in the pharmaceutical industry. Over time I became involved in different projects with a range of health conditions (e.g. Multiple Sclerosis, oncology and diabetes) I was gradually able to develop expertise and skills in specific areas to support the theoretical underpinning and the development a broad range of programmes.

My time in this company saw me being promoted from an 'Assistant Health Psychology Specialist' to a 'Health Psychology Specialist', making me the leading representative of the health psychology department for the German office with a significant increase in responsibility compared to my previous job role. I gained a lot more independence and autonomy through more decisional input, and sometimes the final approval of the deliverables by a psychologist, such as research reports and materials. Although the increase in independence suited my natural style of being an autonomous worker who strives by working in isolation, however in certain situations this tendency exceeded my capabilities and necessary experience. As I am a person who tends to keep to herself and who enjoys the challenge of working problems out independently, I tended to make some decisions on my own towards the beginning where I would have benefitted from a more senior opinion. Due to language barriers relating to the fact that I was the only German-speaking team member, this limited my opportunities to get detailed feedback about every aspect of my work, especially for written documents, which added significant pressure on me and my line manager, as this made the reviewing and feedback process by a more senior colleague significantly more challenging. After experiencing difficulties in my

working practice resulting from a gap in the communication loop, my line manager and I arranged more regular 1:1 meetings to ensure more opportunities for me to discuss my ongoing work projects, and for her to ask directed questions to help me identify any potential conflicts or gaps in my work plans prior to implementation.

My personal tendency to gravitate towards working more independently also became evident when I was faced with challenges during my doctorate training at university. Although this had a positive impact on my ability to make bigger progress between the supervisions, I increasingly became aware that seeking support is a necessary and important part of training and working under supervised practice, but also in the future as a chartered Health Psychologist, when other professionals have a greater experience and knowledge in certain areas. Having regular meetings with my team at work as well as other trainings of the doctorate programme as a platform of discussing and sharing experiences regarding particular aspects of our work helped me foster this understanding and has contributed to a more positive view of team support as a useful tool to progress professionally and become more autonomous rather than being a hindrance. Additionally, I found that the social support affected my emotional wellbeing positively, as I was able to identify with other trainees who were in a similar situation and experienced similar challenges to mine, which I found relieving or even empowering when positive experiences and milestones were shared. This experience of having a close professional support network was very different from my previous experience in my Master's programme outside the UK, which had a much larger group of students which made it difficult to connect with individuals for intense and ongoing guidance. Moreover, regular 1:1 supervision meetings with my university and placement supervisor were extremely valuable to me and have significantly contributed to my professional autonomy, helping me to consciously reflect upon positive accomplishments on the one hand, and also identifying developmental needs, inspiring me to continuously progress and improve. I believe that in order to achieve a healthy balance between using other professionals' guidance and working independently it was important to recognise that seeking support does not equal with weakness, but rather means a crucial

ability to identify and accept the limitations of my practice, and where it was required to seek out eternal guidance. It not only ensures that I am doing my work correctly, but also comes with personal benefits for me by taking away any burden and being able to work more effectively on the long run.

1.1c Demonstrate the need to engage continuous professional development

During two years on my training I actively sought opportunities to upskill my experience and knowledge with the aim to engage in continuing professional development. I have continuously detailed my professional experiences and learning processes in the form of daily reflective logs, and how they individually relate to the specific components of each competence of the doctorate handbook. These were revisited regularly and synthesised into monthly logs which helped track my development, and was subsequently reviewed and signed by university supervisor, who provided me useful feedback relating to my experience. At my workplace I had weekly informal meetings with my line manager, who holds a PhD in health psychology, where I had the opportunity to obtain relevant feedback on my practice as a health psychology trainee. More formal monthly 1:1s took place where we both reflected on my practice over the last month and identified developmental needs, including adequate coping strategies.

I attended all lectures and workshops provided by the Professional Doctorate Programme in Health Psychology, which have fostered profound understanding of the learning outcomes of the training, and necessary skills outlined by the five core competencies. These sessions provided opportunity to exchange useful ideas and prompted interesting discussions, which enhanced the learning process for me by helping me to engage with the content more actively. Apart from the mandatory training of the programme, I participated in workshops, which were organised by London Metropolitan University with the aim to upskill in more generic competencies, including networking and public presentation skills. These learning opportunities have been helpful for me in positioning myself with my skills and capabilities in

front of others in a professional context.

As a member of the Division of Health Psychology, a professional body within the British Psychological Society, I had access to a range of useful events and workshops aimed at its members, which I used to broaden my knowledge on particular topics and relevant areas for health psychology, including a HCPC workshop, a presentation of different health psychology career perspectives, and a workshop involving the use of clinical skills with patient. My subscription to the regular newsletters and the magazine 'The Psychologist' helped me stay up-to-date with current developments in the health psychology area and potentially interesting events, such as congresses.

Completing my research competence for my professional doctorate has led to my first publication of an academic paper, a systematic review on the accuracy of self-reporting food in obese populations, for which I led on the publication as the corresponding author. Although the editing process required by the journal was very challenging for me, it gave me an essential idea what specific steps are involved in a publications, and how profound the quality of the work needs to be. The accomplished publication was an important milestone for me, especially since I had never conducted a systematic review before, coming from a foreign education system. Moreover, having contributed to a significant piece of research prior to the design of an intervention aimed at paediatric patients with juvenile arthritis and psoriasis gave me the opportunity of being accepted for poster presentation at two conferences in the health sector, including the UKSBM (UK Society for Behavioural Medicine) in November 2016 and the UCL Behaviour Change Centre Conference in February 2017. Both experiences were extremely valuable as they provided a satisfactory exchange with professional peers, and new interesting findings that are applicable to my work area. I reflected about my experience of attending and presenting at the UCL conference in a blog post on my company's LinkedIn page, which was shared with relevant audiences.

1.2.Professional Skills

1.2a Communicate effectively

Being a recent graduate with minimal work experience when I enrolled onto the programme and having moved to the UK recently from a different country with a different cultural and language background, I was required to familiarise myself with the differences in professional communication at a relatively fast pace. I made a conscious effort to look for training opportunities to upskill my professional language, and participated in workshops on public presentation and networking, both provided by my workplace and London Metropolitan University. These learning opportunities in combination with increasing exposure to team meetings, presentations in client pitches and congresses, have resulted in a rapid learning curve for me. Reflecting back on the two years, I believe that I have gained significant confidence in my communication skills, both orally and written.

Moreover, coming from a primarily academic background and communicating with a multidisciplinary team and clients with a strong commercial focus has challenged me to develop flexible communication skills, as this required adapting my style of presenting my ideas. While within the psychology team, I used psychological technical language, my interactions with the other teams (e.g. project managers or the creative team) required implication of terms and a stronger focus on practical implications.

Regarding the quality of my academic writing, I have worked hard on upskilling these through regular reviews and feedback of my written work, both by my doctorate supervisors and my work supervisor. Reflecting on my development and the quality of documents towards the beginning of my training, I can identify significant improvements in my professional linguistic expression. I think this is an important personal achievement for me, as I previously had no experience with the use of the English language in a scientific and academic context in regards to my previous education.

1.2b Provide appropriate advice and guidance on concepts and evidence derived from healthy psychology

In my job as a specialist in health psychology, offering appropriate advice and guidance has been extremely important for the nature of my role within the wider team at work. I was responsible for ensuring that the proposed intervention designs were aligned with respective guidelines and psychology derived methods were chosen and implemented correctly. This often entailed conducting research primary research, for example literature reviews or patient interviews, to get a deeper understanding about patients' self-management needs in regards to their condition and treatment, which required prioritisation in the programme materials. Establishing clear criteria of required sample characteristics (e.g. illness diagnosis, prescribed treatment profile and country of origin) ensured that I was able to implement a tailored approach for the intervention design by adjusting the concepts and topics to the population's individual needs. Following the research phase, identified support areas were fed into a health psychology framework which was developed by the clinical team at my work, and referred to as the 'Self-Management Framework'. Similar to the COM-B model (Michie et al, 2014), this model aims to structure identified behavioural drivers and barriers into meaningful clusters, however the categories were adapted to the usual outcomes that were usually targeted in the programmes, and also more suitable to use in client presentations, as it offered a simpler and more direct terminology when referring to the categories. I referred to this framework when I outlined proposals with behaviour change background for interventions, which I presented to the project management team, and following the project approval, to formulate the theoretical rationale.

Another important area where I had the opportunity to contribute to the pool of knowledge and skills was sharing my own knowledge base across the health psychology network while supporting the understanding of clinical offering and approach across the wider company's network. Due to previously acquired expertise in certain topics (e.g. haemophilia, health-related quality of life, healthy lifestyle) or research methods (e.g. discriminative analysis, advanced quantitative methods) I was available for

reviewing or giving feedback whenever specific advice was required, either for my own project or if a colleague wanted to hear an opinion of a person with a more in-depth knowledge in this area.

1.2c Build alliances and engage in collaborative work effectively

As I was part of a team sitting within a multidisciplinary company, I was responsible for leading the clinical development of behaviour change interventions. Working under the direction of more senior Health Psychologists, my job role involved the evaluation of existing clinical research and supporting the design of new patient research according to client requirements, supports the development of the clinical rationale underpinning the patient support approach, ensuring consistent implementation of clinical approach, while working directly with client team members. I collaborated with a variety of professionals closely on a daily basis, including project managers, who primarily were responsible for administrative tasks and communication with clients, graphic designers who translate the written programme components into an appealing design and the digital team who execute the intervention digitally (for example ensuring that SMS were sent out weekly). This meant that rather than working in isolation, I retrieved professional input from other teams on an ongoing basis in order to work effectively and to implement my ideas in the appropriate format. This was only possible with an ongoing dialogue to ensure optimal communication and alignment regarding the required work output and process. As my nature of my work environment meant that I was often working with rigid timelines and budgets, it was my responsibility to adhere to these guidelines. I ensure to be extremely conscious about time keeping and flagging to my best ability when I expected constraints as certain tasks may take more time than planned or are unrealistic. In addition to this, I collaborated with journalists and medical writers to ensure that the tone and style of the texts were user-friendly, and to seek professional guidance on a topic that required more in-depth medical knowledge.

1.2d Lead groups or teams effectively

I have the impression of having accumulated profound experience and confidence in leading with various opportunities throughout my time as a trainee. I have identified opportunities where I positioned myself as a thought leader, when I was made aware of our nurse team that they would value more training by the psychology team. I responded by organising and leading regular practical workshops, demonstrating how the health psychology theory is applied in the nurses' work within the call centre by practicing clinical skills. The feedback I received was very positive, as the team felt more engaged and familiar with our working process. In order to foster this improved relationship further, I included the nurse team in the development of the interventional call scripts between the nurse and patient by reviewing and incorporating their ideas and suggesting, recognising their valuable clinical experience and skills of yearlong communication with patients. Additionally, I accepted an opportunity to lead a group of postgraduate pharmaceutical workshops by supporting them in the development and application of clinical skills, predominantly Motivational Interviewing techniques, during their consultation with patients.

Moreover, I have become more confident in influencing important decision makers, especially coming from the pharmaceutical industry, by presenting in pitches where I was able to convince with my concepts in several instances. For example, I contributed to winning new business by a respected German client in the area of Lupus disease. As a result of my leading role in the German health psychology department, I was exposed to various testing opportunities that contributed to strengthening my confidence in presenting and negotiating my ideas to senior managers in my company, and taking on important decisions, which were discussed in weekly leadership meetings.

2. <u>Practitioner reflection</u>

I definitely believe that I have professionally learned and accomplished

the required skills required by guidelines of the Doctorate in Health Psychology during the two years of training. It was an incredibly valuable learning experience for me, which provided a range of great opportunities to enter into the working life of a health psychologist. The entire training period was a great opportunity for me to be able to put my existing knowledge that I had acquired over many years into practice, and further advance my skills with additional competencies which I was new to. I was exposed to a range of enriching experiences that gave me the chance to venture into many different fields within the work of a health psychologist. Although this was overwhelming and challenging at times, I enjoyed the most part of it, and I feel very proud of what I have accomplished.

My continuous exposure to a commercial work environment as a health psychologist, meant that sometimes I felt that I needed to adjust the scope of my work due to budget restriction, which meant I continuously had to strive for the right balance between the scientific, psychological standpoint and commercial considerations, which added an interesting and useful component to my training.

In my ongoing reflection about my professional development I have learned that I have a natural tendency to work very independently, which can both be a blessing and a curse at the same time, and I have increasingly learned to reflect in which situations I benefit from seeking professional guidance, which I think was one of the biggest challenges I faced in terms of personal development.
I hope to continue growing professionally as much as I have over the past two years in the future, as I feel very passionate and excited about intensifying my skills and abilities. Although this portfolio details how I have accomplished the required competencies to become a health psychologist, I will aim to upskill and broaden my expertise continuously after completing the training, and I am looking forward to taking on any new challenges and pursue opportunities, wherever my professional path will take me.

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