Univerzita Karlova v Praze

Filozofická fakulta

Katedra Psychologie

Diplomová práce

Bc. Martin Čadek

Vliv tělesného stigmatu na vztah pacienta a lékaře

The impact of weight stigma on the patient-healthcare provider relationship

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Prohlašuji, že jsem diplomovou práci vypracoval samostatně, že jsem řádně citoval všechny použité prameny a literaturu a že práce nebyla využita v rámci jiného vysokoškolského studia či k získání jiného nebo stejného titulu.

V Praze dne 8.8.2016

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Bc. Martin ČADEK

Abstrakt:

Studie spočívá ve vytvoření experimentu, který má za cíl ověřit vliv tělesného stigmatu (tj. obezity) na kontakt mezi doktorem a pacientem. Teoretická část obsahuje prostudování a popsání současné literatury k tématu. Dále vymezení a definování pojmů obezita, předsudek, stigma. Závěrem je obsažena kritická reflexe současné úrovně vědění. V části experimentální jsou účastníci náhodně rozděleni napříč osm experimentálních podmínek, které spočívají ve zhlédnutí videa obsahující poskytování odborné rady ze strany lékaře. Podmínky se liší v pohlaví a váze lékaře, dále také v obsahu informací, které lékař podává pacientovy. Hlavní výzkumnou otázkou je, zda se budou lišit postoje účastníka (v roli pacienta) vůči lékaři s obezitou, oproti lékaři bez obezity napříč experimentální podmínky. Data jsou analyzována pomocí mnohonásobné analýzy rozptylu a analýzy kovariance. Výsledky studie jsou v souladu s předešlou literaturou.

Klíčová slova:

stigma, obezita, předsudky, diskriminace

Abstract:

The study involves an experimental procedure which addresses the influence of body shape (i.e. obesity), on contact between the doctor and patient. The theoretical part includes studying and describing the current literature relevant to the topic, defining concepts of obesity, prejudice, and weight stigma. The theory concludes with a critical reflection of the current level of knowledge. For the experimental part, participants are randomly assigned across several experimental conditions, which consist of video views an expert advice from the doctor. Conditions vary gender and weight physician, as well as the content of the information the doctor gives to the potential patient. The main research aims are to provide an evidence on how is the weight stigma influenced by various factors, especially gender of HCPs, the information they are providing, their weight status, and other relevant sociodemographic characteristics on the side of a participant. Data are analysed with multivariate analysis of covariance and analysis of covariance. The study results are consistent with previous findings in literature.

Keywords:

Content

1. Introduction

Since the beginning of 21st-century obesity has received an increased media attention causing moral panic in society. Due to its worldwide prevalence the term 'globesity' was coined (Kline, 2010). Obesity remains an elusive condition that endures, despite countless attempts to intervene (Callahan, 2013).

Whilst it is possible to define obesity simply 'as an excess proportion of bodily fat' (Callahan, 2013, p. 34), the following definition is in line with the World Health Organization (WHO): body-mass index (BMI) $\geq$ 30 kg.m^2 which is a simple measure of body mass (kg) relative to the square of height (m) (WHO, 2013). Although BMI is not precise and does not reflect a fat distribution in the body (Maggi, Busetto, Noale, Limongi, & Crepaldi, 2015), it remains the most practical and universal measure to define obesity (Onis & Lobstein, 2010).

1.1. Focus of the Thesis

The classical definition of stigma was offered by Erving Goffman (1968) who explains that stigma is '*an attribute that is deeply discrediting*'. Weight stigma is then defined as '*a discredited stigma that is overtly visible to others and prevents obese individuals from social acceptance*' (Brownell, 2005, p. 109).

The current work deals with the issue of weight stigma in the medical setting (2.1.). While there is a large number of studies that address the issue, a considerably small portion of them investigate the impact of weight stigma on healthcare professionals (HCPs) with obesity, but as Margaret McCartney says, "Fat doctors are patients too" (McCartney, 2014). In 2009, the UK Cross-Government Obesity Unit estimated that out of 1.2 million National Health Service staff (i.e., NHS), 300,000 would be classified as obese and 400,000 as overweight (Cross-Government Obesity Unit, 2009).

Furthermore, studies on this topic report that there are negative reactions from patient towards overweight and obese HCPs. These reactions include more mistrust, lesser adherence to medical advice, lower confidence in advice of doctor, and lower confidence in ability of overweight and obese nurses (Hash, Munna, Vogel, & Bason, 2003; Hicks et al., 2008; Puhl, Gold, Luedicke, & DePierre, 2013).

Thus, the primary purpose of this study was to examine the impact of weight stigma on *obese* HCPs. Previous studies started this line of research, however as the section 2.14. described, additional research is needed in order to answer whether stigmatization occurs when HCPs

differ in gender, healthcare advice they provide, while controlling for additional variables (i.e., BMI, age, gender, and level of prejudice) on the side of potential patients. Furthermore, this study used a video recordings of HCPs which offers much higher ecological validity than any of the previous studies (2.13).

2. Literature Review

2.1. Defining key terms

This study uses a variety of terms that needs to be defined before the review of the literature and the broader examination of the topic. Subsequent terms are interconnected via weight stigma; thus they are defined in a way which considers such connections.

In addition to the definition of weight stigma offered in the Introduction, '**Stigma'** as a term comes from old Greece where it was described as an unusual body characteristic, meaning 'mark', 'spot' or 'tattoo' (Brown, 2010; Brownell, 2005). According to Goffman (1968), Stigma limits our social relationships, he then continues that there can be stigma related to the body, individual character and the tribal stigma (i.e., race, nation and group membership), (Goffman, 1968). Goffman also uses the typology of 'discredited' and 'discreditable' stigmas defined as 'stigmas known to others' and 'stigmas that can be concealed' respectively (Goffman, 1968). Finally, stigma '*conveys a social identity that is devalued in a particular context*' (Crocker, Major, & Steele, 1998; in Schneider, 2005, p. 474).

The next term to define is a **bias,** '*or the way that thoughts, feelings, and behaviours may by altered because of a stigmatizing mark*' (Brownell, 2005, p. 122). The connection between bias and stigma is contained in its definition, but also the relationship with stereotypes, prejudice, and discrimination. In fact, these terms are often represented as the cognitive, affective, and behavioural biases (Fiske, 1998 in Brownell, 2005; Steele, Choi, & Ambady, 2004). The appropriate term in the discourse of weight stigma is *weight bias* (Angela S. Alberga et al., 2016).

Defining each of the terms mentioned above. First, **stereotype** as the term in social sciences was introduced by Walter Lippmann in 1922 with an often quoted definition that stereotypes refer to 'pictures in our heads' (Lipmann, 1922 in Brown, 2010; Hamilton, 2015). More recently, stereotypes are perceived as general cognitive phenomena namely schema (as defined by cognitive psychologists) or social schema (as defined by social psychologists), which serves as a general way to process information (Hamilton, 2015).

Prejudice is an *attitude* that consist of three components: emotional, behavioural and cognitive component (Fazio & Olson, 2003; Fiske et al., 2010). The emotional component of prejudice is with positive, negative, or both, evaluations of members of various social groups (Whitley &

Kite, 2009, p. 11). This evaluation stems from reaction towards general social category represented by a stereotype (Puhl & Heuer, 2009; Whitley & Kite, 2009, p. 11).

However, in a relationship with weight stigma and weight bias, stereotypes of obese people result in erroneous generalisations compromised of negative beliefs (e.g., Rebecca M. Puhl & Heuer, 2009). This relationship leads to Allport's definition of the prejudice as '*antipathy based upon a faulty and inflexible generalisation (…) it may be directed towards an individual because of their group membership or a whole group, expressed or felt*' (Allport, 1979, p. 9).

Alternatively, a modern definition describes prejudice as a negative evaluation or feeling, or both, towards another person based on the group membership within a particular context (Fiske et al., 2010; Steele et al., 2004).

Finally, **discrimination** is an inclination to treat another person inappropriately and differently from others because of their membership in a particular social group (Fiske et al., 2010; Whitley & Kite, 2009). Preferably with regards to the current study, it can be defined as '*person's experience of being treated poorly by others because of his/her weight*', thus the weight discrimination (Dutton et al., 2014). Discrimination relates to the behavioural component of prejudice.

When studying weight stigma, stereotypes, prejudice, and discrimination towards people with obesity, multiple factors have to be considered.

2.2. Globesity

Globally, the proportion of adults with a BMI of ≥ 25 kg.m^2 (overweight or obese) has increased from 1980 to 2013 from 29% to 37% and 30% to 38% in men and women respectively. In other words, since 1980 to 2013, obesity prevalence has more than doubled and these trends are slowly progressing, despite the preventability of obesity (Ng et al., 2014).

The relatively high prevalence of obesity (BMI ≥ 30 kg.m^2) is also common in different European countries with 12.8% overall; 14.0% for men and 11.5% for women (Gallus et al., 2014). In Europe in 2013, the 3 countries with the highest obesity prevalence were Croatia (21.5 %), England (20.1 %), and Finland (18.9 %) (Table 4 in Gallus et al., 2014).

Importantly, obesity prevalence varies within populations depending on strata i.e., age, gender, and socioeconomic status (Keating, Backholer & Peeters, 2014; Ng et al., 2014). Whilst studies (Keating, Backholer & Peeters, 2014; Ng et al., 2014) illustrate the prevalence for adults, similarly high levels also exist for children in Europe (2 – 10 years old) where the proportion

of children classified as overweight or obese was 28.4% in 2014 (Ahrens et al., 2014). Taking a global perspective both in developed and developing countries, the prevalence of childhood obesity has increased in recent years (Ng et al., 2014).

2.3. Causes of obesity

The general public perceives obesity as almost exclusively caused by internal factors or in other words, by the factors that are in hands of an obese person (Sikorski et al., 2011). However, this lay assumption is easily challenged when considering the potential causes of obesity (Maggi et al., 2015).

In attempt to summarize its multi-facet nature, the Foresight Report (2007) distinguished seven thematic clusters which determine obesity: **a)** biology cluster (e.g., genetics, metabolism); **b)** individual activity cluster (e.g., physical activity); **c)** physical activity environmental cluster (e.g., cost of physical exercise); **d)** food consumption cluster (e.g., quality of foods); **e)** food production cluster (e.g., market price of food); **f)** individual psychology cluster (e.g., self-esteem, stress); **g)** societal influences cluster (e.g., education, TV watching) (Butland et al., 2007).

The paragraphs below provide illustrative examples from each cluster with recent evidence which are further discussed. The range of the Obesity System Map is beyond this study. However, the full map and report are available at www.gov.uk/government/publications/reducing-obesity-obesity-system-map for an in-depth overview.

For each of the clusters there is a wealth of evidence. For instance, regarding the clusters a), b), c), d) and e) the evidence shows that a complex interplay between an environment and genetic factors exists (Frayling, 2012; Wilding, 2012).

Regarding genetic factors (**a**), a particularly interesting association has been found between the allele of Sim1 and excessive food intake (Holder, Butte, & Zinn, 2000) where the disrupted allele is likely to contribute to severe obesity both in humans and animals (Michaud et al., 2001). Additional support of genetic factors is that parental obesity is associated with higher risk of childhood obesity (**a**). Thus obesity is partially hereditable (Dubois & Girard, 2006). Genetic effects are enhanced if a person with a disposition (i.e., vulnerability to the adverse effects) lives in an obesogenic environment (**c**), or their physical activity is low (**b**, i.e., low intensity, mostly spontaneous activity; Wilding, 2012).

The obesogenic environment is a significant concept in obesity research and is simplistically defined as '*the sum of influences that the surroundings, opportunities or conditions of life have on promoting obesity in individuals or populations*' (Swinburn & Egger, 2002, p. 292). Although this definition is understandable, the concept itself is very complex and identifying all of the environmental variables can be overwhelming (Kirk, Penney, & McHugh, 2010). For the purpose of this study, however, this simple definition is sufficient.

Except for physical activity, the obesogenic environment is also influenced by the availability of cheap high-calorie foods and drinks which is often unhealthy and is promoted by the manufacturing companies (**d** & **e**, Wright & Aronne, 2012). Given the accessibility and increasing prices of unhealthy foods and drinks, it makes sense that there is also an association between low socioeconomic status (SES) and unemployment and later childhood obesity (**d & e**, Brisbois, Farmer, & McCargar, 2012).

The clusters remaining to support with evidence are f) and g). For example, stress (**f**) contributes to the development of obesity i.e., environmental noise, crime, terrorism and stresses at home, and this link was supported in recent meta-review (Ross, Flynn, & Pate, 2016). Additionally, stress is associated with obesity indirectly through means of stigma due to the likely stressful situations, and the immediate and delayed responses (Himmelstein & Tomiyama, 2015).

Finally, education as an example from societal factors (**g**), plays an important role independently or in conjunction with SES as it is reported that more educated and literate individuals consume healthier and less energy dense foods compared to less educated people (El-Sayed, Scarborough, & Galea, 2012). However, there is also contradictory evidence that suggests education is not a factor that determines whether a person becomes obese (Frayling, 2012).

Summarising the evidence on causes of obesity, the lay assumption that obesity is caused primarily by internal factors is inherently wrong.

Furthermore, the Foresight Report (2007) used these previously mentioned clusters to summarise complex causal relations between variables that influence obesity and visualised them in the Obesity System Map. The broadness of potential variables that influence obesity also suggests that remedies need to be equally broad, diverse, and long-term to be successful in reducing obesity prevalence (Butland et al., 2007). Interventions that can help tackle obesity across all environments (physical, dietary, social, economic and cultural) are warranted (i.e., Whole Systems Approach; Butland et al., 2007).

The evidence that obesity is outside of an individual control is compelling. However, the later section (2.14.) will illustrate that weight stigma is widespread and prevalent in western society. Furthermore, by addressing the issue of weight stigma towards obese HCP's, this study will further enrich the social and individual psychology clusters of the Foresight Report (2007) providing novel findings and thus, furthering the evidence base relating to the impact of weight stigma in healthcare settings.

2.4. Weight stigma

Since stigma conveys a social identity and obesity is stigma, the identity of obese individual is influenced by weight stigma. According to Rice, Zitzelsberger, Porch and Ignagni (2004) social identity constitutes images that other people see in us and our understanding of their perception. In other words, the identity of one's body image is significantly influenced by the perspective of another person.

Possibly the earliest identity forming environment is an educational setting. Numerous studies have illustrated that obese people experience their weight stigma for the first time when they attending school (Rice, 2007; Thomas, Hyde, Karunaratne, Herbert & Komesaroff, 2008). This is because the school might be the first setting where a person starts to identify weight differences from others and their uniqueness.

Especially interesting is how a stigmatised person perceives their stigmatisation (i.e., the process of acquiring stigma). Whilst the domain of experience is captured with qualitative methods, the so-called enacted stigma (i.e., stigma perceived by others) is usually explained through quantitative methods (Ogden & Clementi, 2010).

Ogden et al. (2010) captured nuances in the stigma of obesity. They described how people experienced stigma in various situations (documented through interviews), where three themes emerged: impact of obesity, relationship to food, and social context (Ogden & Clementi, 2010). Ogden et al. (2010) captured the impact of their stigma as emotional (e.g., depressed, disgusted, ashamed…), self-perception (e.g., freak, ugly, horrible…), dissociation from their own body (e.g., feeling trapped, not in control of their body…), and various health problems (e.g., diabetes, joint pain, gangrene...).

Obese people perceived food (second theme) as a mood repair, a source of guilt, and often as something that they had ambivalent feelings. Finally, the social theme was represented by limited 'normal activities' (e.g., shopping, dressing, housework…), feeling different from

others, feeling abnormal, or being perceived as lazy and having no drive (Ogden & Clementi, 2010). Their description of weight stigma offers an insight into how people perceive their stigma through their narratives.

Similarly, Thomas et al. (2008) illustrated this on a sample of Australian obese adults. They described weight stigma as often a long-term condition that develops gradually since childhood. This further reinforces the evidence that educational setting can influence the development of weight stigma. They also reported that the portion of participants who did not perceive stigma of obesity were only males. However, such finding do not mean that men are immune to the stigma, in this particular instance, it can be explained by the high proportion of females in their sample (i.e., 83% women; Thomas et al., 2008). Nonetheless, as section 2.6. shows, men are likely to have a different tolerance to weight stigma. Additionally, they reported that people tend to cope with weight stigma by 'switching off', 'ignoring it', or 'making fun of themselves'.

Whilst the significant factor in the development of weight stigma is school and educational setting, other settings are equally important. In 2001, Puhl and Brownell summarised a decade of scientific evidence, reporting that weight stigma can be evidenced in a variety of settings (i.e., educational setting, employment and work setting, and healthcare setting). Nearly a decade later and, in more recent work, Puhl and Heuer (2009) summarised the evidence again. Similarly, the previous settings emerged again supported by the evidence. However, additional domains such as the media, interpersonal relationships, psychological and physical health consequences and stigma reduction strategies, were added (see Table 1 in Puhl & Heuer, 2009). The current study focuses on healthcare setting and therefore there are worth mentioning at this point.

Between 2001 and 2009, Puhl et al. (2013) identified that obese patients in healthcare settings suffer stigmatisation not only from HCP but also from medical student, despite the medical training students and doctors receive. Although the dominant focus is on weight stigma experienced by obese patients, studies focusing on obese doctors and other HCP have appeared more often in recent years (e.g., Lovell, Parker, Brady, Cotterill, & Howatson, 2011; Puhl, Gold, Luedicke, & DePierre, 2013; Zhu, Norman, & While, 2011).

Finally, while numerous examples of weight stigmatisation in healthcare setting exist, they are documented mostly through weight discrimination (Puhl & Brownell, 2001). For example, a situation in which general practitioner has a tendency to focus on mental state of obese patients (i.e., subscribing anti-depressants) rather than on obesity itself (Thomas et al., 2008). Because

the observable feature of weight stigma is discrimination, the overview concerning weight stigma at medical setting will continue in section about weight discrimination (2.14).

2.5. Health consequences of weight stigma

Weight stigma negatively affects the recipient's health in a variety of ways. As mentioned at the beginning of the literature review, one of the ways (i.e., health condition) is mediated through stress.

Stress, however, is just the beginning of the issue. Brewis et al. (2014) described how stigma and stigmatizing settings lead to increased weight gain through direct behavioural changes (i.e., engaging in risky dieting, avoiding medical settings), stressful situations (i.e., stigmatizing materials elicit stress, experiencing stress increases BMI), changes in social network (i.e., isolation from friends, lack of social support), and organizational effects of discrimination (i.e., lower income, obesity wage penalty) with women and children being more exposed to all aforementioned.

Furthermore, O'Brien et al. (2016) discovered that by means of weight bias internalization (i.e., a self-directed weight stigma), weight stigma contributes to disordered eating behaviours (i.e., such as binge eating, night eating, and bulimia), the association clearly emerged and the evidence was placed among other negative outcomes (i.e., bullying, teasing, stress) of weight stigma review by authors. Similarly, Schvey, Puhl and Brownell (2011) reported that weight stigma leads to higher calories consumption.

The consequences of weight stigma are also documented in the domain of mental health; excluding the already mentioned stress (Davison, Schmalz, Young, & Birch, 2008; Pearl, White, & Grilo, 2014). Davison et al. (2008) measured on self-report scales, the overall well-being of young girls between 9 – 11 years, and found out that the overweight participant had significantly lower well-being than non-overweight. Similarly, a recent cross-sectional study used self-report measures to assess both mental and physical well-being, including depressive symptoms (Pearl et al., 2014). The results confirmed that weight stigma contributes to poorer mental health outcomes and that the effect is mediated by weight bias internalisation (O'Brien et al., 2016; Pearl et al., 2014).

In the light of the previously mentioned evidence, it is not surprising that weight perception is negatively influenced by weight stigma where participants perceive their weight as higher and

attribute themselves similar bias as the people who are normal weight (Schafer & Ferraro, 2011).

In conclusion, weight stigma negatively affects the quality of life of obese people, which has serious implications regarding intervention programme for public health system (Puhl & Heuer, 2010). Moreover, weight stigma is prevalent among HCP (including medical students), leading to lower quality of healthcare (2.13.), which can hinder the solution to weight stigma despite HCPs best intentions (Phelan et al., 2015).

2.6. Gendered nature of weight stigma

Due to its gendered nature, weight stigma is of interest to an increasing number of feminist scholars (Fikkan & Rothblum, 2011). Carla Rice describes how overweight women deal with their social stigma of being obese through revealing narrative stories describing the struggle of *not* fitting with the beauty standards, being too big, unfeminine, and what coping strategies these women use to overcome their stigma (Rice, 2007). An example of one of the stories is below:

> *Gayle: In Grade 4, Thomas Lum, yelled out at me, "Fat." I tried to run after him and catch him, but I'm not built to run. I thought, "My God, I am fat." That was the first time I can remember it really impacting on me. From that point on, things went downhill with my attitude with my body.* (Rice, 2007, p. 242)

Rice concluded that current trend to frame obesity as a disease may have harmful effects on children and young females. She wrote that, '*Their narratives (stories of women…) show how designating obesity as a dangerous disease supports morally-laden health discourses and pedagogical practices that fix fat bodies as unfit.*' (Rice, 2007, p. 250).

Whilst there is a focus on women, it would be inaccurate to interpret it as an unimportant problem for men. Generally speaking, they feel similar issues and can probably relate to the experiences of women. Since men are not criticised as openly as women, they might cope with obesity by ignoring it up to a certain point. However, this does not prevent them from seeing their overweight body as 'personal failure', or feeling 'embarrassed,' 'depressed,' or 'disgusted' (Lewis, Thomas, Hyde, Castle, & Komesaroff, 2011). Lewis et al. also note, that the barriers for men to change their lifestyle include: *a Lack of support from family members and friends, a lack of time to engage in activities, affordability of living a healthy lifestyle, and weight-*

based stigma (Lewis et al., 2011). Ultimately, their personal experience might not be that different from women's experiences as describes the following commentary:

> *'Just walking into a gymnasium is hugely embarrassing. You may as well walk*
> *in there naked because everyone turns to you and looks at you and you can*
> *just about hear them going 'oh yuck'.'* (Lewis et al., 2011, p. 465)

The purpose of the last paragraphs on the gendered nature of obesity was also to show that it will only benefit researchers studying social aspects of obesity to merge their forces with feminist researchers so they can explore the topic even further. This conclusion is similar to those in articles written by Rice (2007) and Fikkan & Rothblum (2011). However, the main reason was to provide an insight into gender aspect of weight stigma.

Stereotypes and weight stigma

It is unsupported by empirical evidence to claim that stereotype as a *generalisation (i.e., in a cognitive sense)* is frequently inaccurate, biased by nature or inherently wrong (Jussim, Cain, Crawford, Harber, & Cohen, 2009). However, in a situation where stereotypes are strongly associated with stigma, the focus naturally shifts towards their negative side and stigma serves as a cue guiding a particular stereotype (Schneider, 2005). Stereotypes towards obese people are associated with weight stigma because the evidence is almost exclusively reporting the negative content of stereotypes, i.e., the stereotype is *biased* by weight stigma.

Typically, negative stereotypes about obese people among the general population include laziness, gluttony, unintelligent, lacking self-discipline, poor hygiene, low competence, sloppy, emotionally unstable, unattractive, or unhappy(Puhl, Moss-Racusin, Schwartz & Brownell, 2008; Vartanian & Silverstein, 2013).

Since stereotypes include an emotional aspect, it is mainly 'disgust' that is associated with obesity (Vartanian, Thomas, & Vanman, 2013). Finally, negative stereotypes are also reported among children who express them towards their overweight and obese peers (Durante, Fasolo, Mari, & Mazzola, 2014).

Although these stereotypes are not objective representations of obese people, they represent shared beliefs about how a lay person perceives such group (Fiske et al., 2010). In this case, the stereotype towards obese people is a systematic error (i.e., erroneous generalisation) with dominantly negative content (Jussim, Cain, Crawford, Harber, & Cohen, 2009; Schneider, 2005).

Lastly, stereotypes towards obese people are also influenced by culture. Most evidence of negative stereotypes towards obese people is found within developed and industrialised countries. As mentioned by Schneider, in economically developed countries a lean person is usually someone of higher SES, whilst in countries where food is hard to acquire, being obesity represents wealth (Schneider, 2005, p. 504).

Furthermore, evidence confirms that different evaluation of obese people is prevalent among members of African-American culture, namely that obesity is more tolerated (Brady, 2016; Latner, Stunkard, & Wilson, 2005). The other reason for such difference between developed and underdeveloped countries is the overreliance of developed countries on the "thin ideal" or "ideal of thinness". The ideal then serves as the standard measure of beauty, fitness, health and much more (Klaczynski, Goold, & Mudry, 2004; Puhl & Heuer, 2009). This measure of beauty has a detrimental impact especially on women in Western countries which results in higher rates of various eating disorders (e.g., Bordo, 2004; Schneider, 2005).

Aligning these findings, a theoretical framework that would explain why are obese people perceived in such a way (i.e., why the stereotype towards them is so negative and deteriorating), is the Stereotype Content Model (SCM) and the BIAS Map (Behaviours from Intergroup Affect and Stereotypes) which provide a sufficient explanation (Cuddy, Fiske, & Glick, 2008). The SCM proposes that individuals are evaluated along two domains; warmth and competence. These domains, in turn, drive the perceiver's emotional and behaviour reaction towards a particular individual. Furthermore, according to the BIAS Map, these domains form four possible combinations of warmth and competence (e.g., such as low warmth and low competence, or high warm and high competence). These combinations serve as unique sets that predict behavioural and affective reactions towards an individual (Cuddy et al., 2008; Cuddy, Fiske, & Glick, 2007). Whilst the warmth includes traits such as good-natured, trustworthy, tolerant, friendly, and sincere, competence includes capable, skilful, intelligent, and confident (Cuddy et al., 2008, p. 65). 'Reversing' the traits of competence trait, their connection to discussed earlier stereotypes starts to become obvious (i.e., such as capable becomes lazy or less competent, or intelligent becomes unintelligent). Not surprisingly, when the Both the SCM and BIAS were recently applied by Levine et al. (2015) on weight stigma they assumed in their hypothesis that obese people would score low on competence (Levine & Schweitzer, 2015).

Numerous research provides evidence of strong negative emotions (i.e., disgust); (Wirtz, van der Pligt, & Doosje, 2016). Therefore, Levine et al. (2015) identified disgust as the emotional reaction stemming from perceiving people as low-competent, opposite of that would be a

sympathy but possibly due to obesity as a 'disease perception', disgust was emerging (Levine & Schweitzer, 2015). Finally, Levine et al. (2015) found that obesity is not associated with the warmth domain. However, an obese person is able (as any other person) to control whether they elicit warmth intentionally, thus mitigating the impact of low-competence and disgust (Levine & Schweitzer, 2015).

Finally, the interesting question is how are these findingPHs applied to healthcare settings or rather at HCPs themselves. It seems reasonable to assume that obese HCPs suffer from similar problems with low-competence. One of the earliest accounts of this was provided by Hash et al. (2003) who find out normal weight physicians elicit higher confidence of patients in comparison to obese physicians (Hash, Munna, Vogel, & Bason, 2003). Though it is noteworthy that Hash et al. (2003) used a quasi-experimental design and patients who were evaluating their doctors could have been susceptible to various biases that were left uncontrolled (e.g., researcher bias, social desirability bias).

Recently, Puhl et al. (2013) provided evidence that HCPs with obesity elicited significantly less favourable reactions from patients in comparison to their normal weight counterparts (Puhl et al., 2013). The patients were less likely to follow their advice, and more likely to change the HCPs. Although self-report measures and only photographs were used, the study provided an important insight into some of the stereotypes, prejudice and potentially a discrimination associated with obese HCPs.

Given that weight stigma varies based on gender, this characteristic will be carefully examined in the study both on the side of participants and HCPs.

2.7. Contributing factors – Controllability

A body of research shows that those people prejudiced towards obese people, tend to view their condition as 'controllable' (see further). In other words, prejudiced individuals attribute controllable causes to obesity. Therefore, an individual is responsible for their weight status if it is within their control (Carels & Musher-Eizenman, 2010; Crandall & Schiffhauer, 1998; see also Crandall et al. in Nelson, 2009; Puhl & Brownell, 2003).

This is fuelled by 'political conservatism, symbolic racism, authoritarianism, and the tendency to blame economically disadvantaged persons for their poverty' and so 'called just world bias' which is an assumption that person achieves what they want if they simply try hard enough (Crandall, 1994; Puhl & Brownell, 2003). The overreaching theoretical framework of

controllability, the Attribution Theory (Heider, 1958) is discussed separately in section 2.12.1 investigating theoretical accounts of weight stigma (Crandall & Martinez, 1996). The belief of obesity (held by a lay person) being caused by the internal factors is searchable also in more recent articles (Sikorski et al., 2011).

The controllability is a persistent belief that endures, despite a clear evidence of multi-facet nature of obesity (2.3.). Its impact on medical setting depends on the perspective of evaluation. The controllability belief is likely to be prevalent among HCPs as education and training of HCPs is focused on controllable aspects of obesity (i.e., dieting), which paradoxically is a contradiction when considering the evidence of multifactorial determinants of obesity.

In fact, as Matharu et al. noted in their study aimed at reducing the bias among HCPs that '*Lectures on obesity management rarely include information encouraging empathy or sensitivity toward obese individuals because the most emphasized aspects include "controllable factors" such as exercise and diet.*' (Matharu et al., 2014, p. 231). Including interventions directly to education of HCPs as Matharu et al. (2014) did was previously suggested by Swift Hanlon, El-Redy, Puhl and Glazebrook (2013) who commented that '*promising approach for future interventions would be the provision of balanced education about the controllability of obesity, focusing on genetic and environmental factors, as well as diet and exercise*' (p. 395). Swift et al. (2013) assessed through self-report measures weight bias levels among 1130 UK trainee HCPs. They have found significant levels of fat phobia across all programmes and significant levels of beliefs of controllability at particular programmes (i.e., nursing). However, possibly the largest study up to date was by Phelan et al. (2014) who assessed both implicit and explicit weight bias on a sample of 4732 medical students. Although they could not assess the specialisation of students as thoroughly as Swift et al. (2013). The study of Phelan et al. (2014) utilised the implicit association test (IAT) to measure the weight stigma. This study has stronger research design as it allows for a comparison between explicit and implicit bias. Results were in line with previous evidence as the majority of students exhibited implicit (74%) and explicit (67%) weight bias.

Controllability is a factor that is possible to measure by Beliefs About Obese People scale developed by Allison et al. (1991). Therefore, the scale will be used in the current study to account for controllability (3. Method).

2.8. Contributing factors – Malleability (the role of blame)

Obesity as a controllable condition can be further extended by specifying that obesity is possible to 'escape'; it is possible to 'cure' obesity (see Crandall et al. in Nelson, 2009). The is worth of highlighting as other prejudices do not have similar malleability aspects (e.g., people cannot change ethnicity) (Crandall et al., 2001).

It should come as no surprise that obese people are often *blamed* for their own condition. Intuitively speaking, it is probably due to both controllability and possibility to avoid obesity. The '*culture of blame*' is according to Thomas et al (2008) maintained through media and public health message (p. 321).

Whilst Thomas et al. (2008) reached their conclusion through interviewing 76 obese respondents, similar results are reported when conducting a media analysis, or particularly as Puhl, Peterson, DePierre and Luedicke (2013) wrote, '*Research demonstrates that news coverage of obesity often blames overweight individuals for their weight and disproportionately emphasizes individual behavior and personal responsibility as solutions for weight issues (…)*', (p. 2).

The role of blame was analysed in a recent study by Wirtz et al. (2016) when they used contempt, pity, anger and disgust as a mediators of proxy measures of discriminatory behaviour. Since the relation of mediators with certain predictor variables, and their contribution to a variety of outcome variables was analysed, they employed methods of structural equation modelling to describe the network that would emerge in their proposed model. A summary of the results from all of three studies described in the article is that the models show how the attribution of blame is mediated mostly by contempt and disgust. Blame in the models both directly and indirectly (mediated mostly by contempt and disgust), determined a higher support of harmful weight policies, prejudice and social distance (Wirtz et al., 2016). Blame is most likely going to be in future studies of weight stigma a concept that is highly interesting to researchers.

Finally, as for the controllability aspect of obesity, even in this case HCPs are not unbiased towards overweight and obese patients. The situations in its negative outcome illustrate the finding from a review of qualitative studies on obesity stigma and responsibility in healthcare settings by Malterud et al. (2011) who note that obese patients often suffer from being blamed for their condition by HCPs.

Additional evidence shows that medical problems of obese patients are often perceived only as being the result of excessive weight (Malterud & Ulriksen, 2011; Puhl & Heuer, 2010).

However, it seems that even a little of unbiased support from HCPs may have an important significance for obese patients:

> '*Over my whole 40-year dieting history I found two doctors who have said, 'well, come back once a week or once a fortnight and I will weigh you?', I found that very helpful and useful, because you feel like somebody is on your side. (65-year-old female)*';
>
> (Box 1 in Thomas et al., 2008, p. 324)

Lastly, blame can also be directed to oneself which is not uncommon (e.g., Thomas et al., 2008). Malterud and Ulriksen (2011) findings show that there is at least an association between higher BMI and blame since those HCPs with higher BMI are more judgmental and critical towards people with obesity. However, their findings are challenged in the systematic review by Zhu et al. (2011) who propose that assuming entirely negative attitudes of overweight HCPs towards overweight patients is simplistic and other factors, i.e., an experience of never having dieted themselves, are necessary for consideration. Interesting would also be to have an answer to whether obese or normal weight patients blame obese HCPs; however no research was found discussing this issue.

2.9. Contributing factors – Social norms

While it is certainly an option to continue to address norms at the most general levels of society, the key question here is, what are the norms of obesity in a healthcare setting (i.e., norms towards obese patients or obese HCPs). When addressing norms, prejudice is not the matter here, rather it is the social custom (i.e., any behaviour considered normal or usual) that is in the focus and it seems logical to assume that weight stigma might bias even a custom. Wear et al. (2006) conducted a study assessing the categories of health conditions which trigger a cynical or derogatory humour from HCPs (i.e., students). The first condition the HCPs named was obesity or rather a humour directed at obese patients. When researchers asked for examples of such 'jokes', one student responded:

> '*There's lots of stories about larger older women who when you lift up their fat, and you see Oreo cookies, a remote... [all] hospital urban legends.*'
>
> (Wear, Aultman, Varley, & Zarconi, 2006, p. 456)

Not surprisingly, when HCPs explained their motives, answers similar this one appeared, as one student said that patient's obesity is (…):

> "*(...) their own fault, because they had to eat to get that way. You look at them in a disgusted way, like 'you can't take care of yourself, now I have to get all these other people to help me out, do a procedure for you and you're probably not going to take care of yourself afterwards.'*"

(Wear et al., 2006, p. 456)

The picture that often emerges, in general, is that HCPs describe their contact with obese patients as unrewarding and frustrating. This in turn facilitates weight stigma and negative attitudes towards obese patients, despite intentionally trying to help the obese patient (Puhl & Heuer, 2009).

Additionally, Richard et al. (2014) analysed a sample of 6,628 unique responses from Medical Expenditure Panel Survey (MEPS) with the aim to find disparities in patient – physician communication (Richard, Ferguson, Lara, Leonard, & Younis, 2014). The study relied on self-report measures and a composite score computed from several questions in MEPS which was afterwards analysed by linear regression methods (i.e., ordinary least squares, OLS). Their findings showed that overall, HCPs spend less time with obese patients than normal weight, appeared to show less respectful treatment of them, and their composite communication score was lower (Richard et al., 2014). Despite suffering from lack of experimental design and use of self-report measures, the study findings may suggest a link between avoiding obese patients due to the frustration HCPs feel when dealing with them and it is also similar to the findings confirmed in review by Puhl and Heuer (2009).

Perhaps the best way how to start changing the norm is through training of HCPs; the guidelines exist, however, they are not implemented (Brown & Flint, 2013). A similar conclusion is in a recent review of weight stigma interventions by Alberga et al. (2016) who analysed 17 studies aimed at reducing weight stigma in a medical setting (Alberga et al., 2016).

Finally, certain health norms also appear to be expected from HCPs. Recently, Puhl et al. (2013) demonstrated that perceived healthcare behaviour of the physician is significantly predicting whether the patient will select HCPs, trust them, or feel compassion towards a particular HCPs (Puhl et al., 2013). The study illustrated that the potential patients expected a healthy behaviour (i.e., not smoking) from their HCPs. However, it suffered from several limitations as it only provided a written description of HCPs and relied on self-reported measures, arguably the results may not generalise on the real situation, although it is the first study ever to assess thoroughly attitudes towards obese HCPs. The study is further discussed in section 2.14.

2.10. Contributing factors – Gender

The gender can be perceived as the source of prejudice or as its target. When it comes to the source, there is a body of evidence showing that males tend to show greater explicit negative attitudes towards overweight or obese targets, even though on the implicit level they do not differ (Brochu & Morrison, 2007; Puhl & Brownell, 2001; Puhl et al., 2015; Vartanian et al., 2013).

The difference also exists among the internal attitudes towards the obesity (i.e., fear of obesity). For males as the BMI is higher, so are the negative attitudes towards the obesity, however, opposite trend is prevalent among females (Lieberman, Tybur, & Latner, 2012).

Focusing on gender as a target, women, in general, are influenced more negatively by anti-fat prejudice than men are (Fikkan & Rothblum, 2011). Women are more likely to become the target of anti-fat bias, are more likely to describe themselves as overweight, and are more salient when they are overweight than men. Furthermore, society puts more value on the physical appearance of women; they are more sensitive to the issue of weight, and more (Brochu & Morrison, 2007; Schieman, Pudrovska, & Eccles, 2007; Vartanian & Silverstein, 2013).

The issue of weight bias with relevance to gender is rather significant discourse, and an important factor in analyses. Furthermore, it is sensible to gather other insights about it in related feminist literature or resources (e.g., Bordo, 2004; e.g., Fikkan & Rothblum, 2011).

The gendered nature of weight stigma was thoroughly discussed in section 2.6., the aim of this section is to present gender as a factor in a medical setting. From the available evidence so far, it is expected that gender will play a significant role in how is the obese HCPs perceived.

The previously discussed study from Puhl et al. (2013) had shown clearly on a sample of 358 adults, that HCPs weight significantly predicted at $p<.001$ a negative evaluation of HCPs by a potential patient. However, their study did not account for a variability of gender, i.e., HCPs were only females (Puhl et al., 2013).

Indeed, gender is a significant predictor of HCPs attitudes towards obesity, as noted in a review by Zhu et al. (2011). However, that tells little about the evaluation of obese HCPs. In fact, only one study offered participants stimuli of gendered HCPs, namely a study by Asimakopoulu, Ignatius, While and Newton (2015). Their study involved an experimental condition in which participants were supposed to evaluate vignettes of the dentist by using a self-report questionnaire.

However, since their design used gender-matched pairs of participants and HCPs photographs, they did not analyse the effect of HCPs gender on respondent's evaluation. Thus it is safe to conclude that there is no study to the knowledge of the author which would assess gender effect on obese HCPs (Asimakopoulou, Ignatius, While, & Newton, 2015). At the same time, given the evidence available on weight stigma, experiences of patients and more, it seems unlikely that there would be no effect at all. Gender is one of the most important factors in the current study.

As mentioned in section about gendered nature of weight stigma (section 2.6.), gender will be an important control variable. The current study will aim to explain potential findings with relevance to gender. It is expected that males and females will elicit and recieve different levels of weight stigma.

2.11. Contributing factors – Age

Older females (i.e., aged 65+ years) are more likely to reject the thin ideal promoted by media than younger females (Lieberman et al., 2012). Concerning children, even very young children (3 years) have reported prejudice towards overweight peers with research demonstrating that overweight children have on average fewer friends and are less likely to become a best friend (Crandall et al. in Nelson, 2009).

Whilst small samples of older and younger people express similar levels of bias, there is also evidence that older participants (i.e., aged 55 – 65+ years) in national studies tend to be more prejudiced towards obese people than younger participants (Hilbert, Rief, & Braehler, 2008; Puhl et al., 2015). Two such national surveys were conducted by Hilbert et al. (2008) and more recently by Puhl et al. (2015). Hilbert et al. used a sample size of 1000 people (559 women) collected through telephone interview survey in Germany. The study utilized correlational methods and linear regression to examine the prejudice towards obese people. Whilst the sample size is still slightly smaller considering the overall population of Germany, the randomized method of sampling and the fact that data were collected in phone interviews produced a high-quality data that justify the smaller sample size (Hilbert et al., 2008).

Alternatively, Puhl et al (2015) sampled in overall larger amount of participants across Canada, the United States, Iceland and Australia (n = 2866). Their study used partially random sampling, and it was not clear whether the data that were gathered online were controlled for quality, but most importantly, only Iceland (n = 802) and Canada (n = 1261) had representative samples

(Puhl et al., 2015). The methods used to analyse bias across the sample in the study by Puhl et al. (2015) were almost identical to those in Hilbert et al. (2008).

These national samples provide an important general description of weight stigma, to address the issue properly, it is necessary to consider how age and weight stigma interplay though lifespan. Hebl, Ruggs, Singletary and Beal, (2008) provided valuable insight into the perception of obesity across life (i.e., from 18 to 77 years) which also covers the age restriction used in this research. They sampled 208 participants (106 males) who viewed photos of 20, 40, and 60 years old faces digitally attached either on slender or overweight body. Participants then evaluated the photos on number of scales (e.g., such as scales measuring attractiveness, intelligence, and happiness) that were developed in line with previous research on weight stigma (Hebl et al., 2008).

Hebl et al. considered each of the conditions (i.e., age and obesity separately) before analysing them together. This is a reasonable approach since stereotypes towards age, or rather, old people elicit different reactions from people (i.e., using the SCM model), they are perceived low on competence (same as obese people) and high on warmth (while obese people do not have such a strong association with warmth (e.g., Levine & Schweitzer, 2015; Hebl et al., 2008).

Results from Hebl et al., (2008) provided the evidence that a) obesity is viewed differently across the age of target (i.e., 20, 40, and 60 years old), b) thinness is most significant factor during youth (i.e., 20 – 40 years old), and c) fluctuation of weight did not affect older (i.e., 60 years old) participants (additionally see Hebl et al., 2008). Overall, their study provided significant evidence for age as an important factor in weight stigma.

However, their study also had few limitations, despite its overall high quality. One of them is the use of self-report measures, another is that the sample description was provided only regarding where the sample was gathered, sample age range, and gender (e.g., no ethnicity, BMI, and other control measures), and although not explicitly said, the sample seemed convenient. Finally, while pictures are possibly an effective stimulus, stronger effects could be reached if authors employed even more convincing stimuli (e.g., such a video, actors).

In conclusion, age is an additional factor will be measured as it is reasonable to expect a variation of weight stigma across different age groups.

2.12. Contributing factors – BMI

As noted in Introduction section, BMI is a measure that does not reflect the actual fat in body precisely. Sadly, direct measures of body fat distribution are costly (CT, fMRI), and their use is unrealistic in large populations (Maggi et al., 2015). Moreover, certain groups such as athletes, generally have a higher BMI due to a larger volume of muscular tissue (Maggi et al., 2015). Lastly, an additional issue with BMI is that while it is accurate for Caucasian people, other ethnic groups (i.e., Asian people) should be classified as overweight at lower BMI cut-offs due to different associations between BMI, percentage of body fat, and health risks (WHO, 2004). The relative inaccuracy of BMI, therefore, need to be considered when evaluating participants BMI in the current research.

Although inaccuracy is an interesting topic, the question is how BMI affects the weight stigma. Previous research and also one of the largest studies ever conducted, was by Schwartz et al. (2006) and documented relationship between one's body weight and implicit/explicit weight stigma (Schwartz, Vartanian, Nosek, & Brownell, 2006).

Their study sampled an online sample of 4283 participants who completed a demographic questionnaire, IAT focused on weight bias, and few items are explicitly measuring weight bias. The study then compared mean scores of explicit and implicit tests across each BMI category (i.e., underweight, normal weight, overweight, obese) which was assessed through a sociodemographic questionnaire (i.e., self-reported BMI).

The results of study documented that participants who were in overweight and obese BMI groups had more positive attitudes about people with obesity, while people within lower BMI groups tended to be more negative both on IAT and explicit measures (Schwartz et al., 2006).

Whilst the study recruited a large sample of participants, there were serious flaws in their methodology. First of all, participants were self-recruited through a site www.weightbias.org. The respondents could not be 'naïve' to the study aim due to the web address used to host the study (Schwartz et al., 2006). Additionally, authors are rather cryptic about which method of analysis they used, while they report Omnibus F, it is not entirely clear whether ANOVA, Chi-Square or other F-statistics dependent test was used. The study did not prevent online ballot box stuffing (i.e., a situation where participants accessed the survey more than once).

Whilst other issues can be identified, these are the most serious and considering their impact, the study provides a mixed evidence to make a conclusive decision about the BMI role in weight stigma.

From recent attempts examining the association between BMI and weight stigma, two reviews are considered.

First, review by Papadopoulos et al. (2015) who reviewed 23 studies published since 2001 to 2015 (i.e., data to 2014) with focus in majority on BMI as a biological correlate of weight stigma (although other correlates are considered too) and to the knowledge of author remains the most up to date evidence (Papadopoulos & Brennan, 2015).

Second, an older review by Puhl et al. (2009) who gathered evidence from approximately two hundred sources, where the focus at BMI was within a broader context of evidence (Puhl & Heuer, 2009). Both reviews are being discussed here respectively as they provide a valuable insight into the BMI as a factor.

A Papadopoulos et al. (2015) revolved around BMI as a biological correlate which is a rather important detail because BMI in their study was in the same relation to weight stigma (i.e., heart rate is to stress). Additionally, they gathered evidence only on overweight and obese individuals, arguing that these be the most vulnerable weight groups. Therefore, the evidence they have gathered, was probably assuming research question similar to 'How much is BMI changing with a degree of weight stigma?'. Their study considered correlations of BMI to both commonly assumed types of stigma; *perceived* weight stigma and *experienced* weight stigma (Papadopoulos & Brennan, 2015).

Out of the studies they have reviewed, five studies found that BMI and *experienced* weight stigma had a positive relationship, i.e., as experienced weight stigma increased, so did the BMI. Furthermore, three studies found no association at all between BMI and experienced weight stigma, however, 2 of those found significant associations with particular types of weight stigma (i.e., being stared at).

Regarding *internalised* weight stigma, none of the reviewed studies found an association between BMI and internalised weight stigma which is interpreted by the authors in a sense that acceptance of weight stigma is not related to weight itself (Papadopoulos & Brennan, 2015). However, these results have to be considered as being under a threshold effect, which means

that they are noteworthy only at population levels, not individual (Papadopoulos & Brennan, 2015).

A potential limitation to their findings is that all of the studies used self-report measures to assess weight stigma which may add to the inaccuracy of results. This research provides two important implications relevant to the current study. Namely, that while controlling for BMI: a) it is crucial to avoid interpreting it individually (i.e., by participant) with relation to weight stigma; b) self-weight stigma should not be expected to correlate with weight itself; and c) predicting weight stigma from BMI is likely to be challenging unless large sample is collected.

The second review is important to consider as it provided additional insight into healthcare setting which was not considered by Popadopoulos et al. (2015). The evidence on BMI relationship to weight stigma is scattered through the review as they have assessed multiple domains (i.e., such as employment and health care). However, the focus here is only at healthcare setting. These are the key findings are;

a) As BMI of patients *increases*, doctors report liking their job less, have less patience and desire to help patients. Patients, on the other hand, perceived themselves as more conscious about the weight-stigmatizing environment (i.e., smaller chairs), reported being perceived as lower status patients (i.e., second class), and delay visit of healthcare institutions and preventive care.
b) As BMI of HCPs *increases*, HCPs are more self-conscious about their size and report rude comments from patients.
c) As BMI of HCPs *lowers*, HCPs are more likely to report negative evaluations of obesity, and their weight stigma is more severe (i.e., stronger implicit weight stigma of HCPs).

The findings from point b) are most relevant to the current research as they suggest that it seems to be reasonable to expect an increase of weight stigmatisation from patient towards obese HCPs. This is confirmed in a recent study conducted by Puhl et al. (2013) which provided important evidence that obese HCPs are more vulnerable to weight stigmatisation from patients. Although as noted earlier in the study did not control for the gender, information given by the HCP, and used only written descriptions of HCPs (Puhl et al., 2013).

Given that weight stigma varies based on the level of BMI, this characteristic will be carefully examined in the study.

It is true that this review could assess a variety of additional factors (i.e., SES, Ethnicity), however, the study is mainly focusing on gender, weight itself and information provided by the HCPs. Therefore, it is deemed unnecessary to review additional factors.

2.13. Theoretical accounts of weight stigma

The following section will discuss possible theoretical explanations of weight stigma. Theories from past decades, such as the *SCM* (Stereotyupe Content Model; Cuddy et al., 2008), *Intergroup Emotions Theory* (Mackie, Devos, & Smith, 2000), *Evolutionary Approaches* (Neuberg, Smith, & Asher, 2000), *System Justification Theory* (Jost, Banaji, & Nosek, 2004), and *Justification-Suppression Theory* (Crandall & Eshleman, 2003) are able to provide some insight.

However, using these theories are not without limitations which hinder their use in the context of anti-fat bias (e.g. Brownell, 2005; Crandall et al. in Nelson, 2009). As Brownell et al. (2015) note, these limitations are represented by an absence of remediation of weight stigma and no specific consideration of weight stigma within any of the previous theories (Brownell, 2005). The absence of remediation means that these theories do not offer any potential solutions to reducing the weight stigmatisation, despite their ability to provide a compelling rationale for the existence of stigmatisation in general (Brownell, 2005). At the same time, none of the mentioned theories were developed in the context of weight stigma. Therefore they are too broad and general (Brownell, 2005).

The next section will provide theories that address both, the remedy of weight stigma, and an approach tailored exclusively to weight stigma.

2.13.1. Attribution Theory

The first theory is Attribution Theory (Heider, 1958) as its perspective dominated the field of weight stigma (Leeuwen, Hunt, & Park, 2015). It was already mentioned that Attribution Theory is an overreaching framework for explaining the belief about the controllability of obesity which is used, mainly to predict weight stigmatisation. Attribution Theory '*(...) is concerned with lay people's beliefs about the causes of human behaviour*' (Brown, 2010, p. 281). While its father is Fritz Heider (1958), the dominant model of Attribution Theory as noted by Bronwell et al. (2005) comes from Weiner's (1993) work (Brownell, 2005; Weiner, 1993).

Weiner et al. (1988) were first to apply the attribution theory framework to obesity, as they proposed that the perceived causal controllability of obesity stigma will determine the affective

reaction of an individual towards the obese person (i.e., anger, dislike, little pity, and neglect). Indeed, the results of their experiments showed, that obesity was perceived as the most controllable among other stigmas (e.g., AIDS, Drug Abuse, and such), therefore the stigma was associated with anger, little pity, and judgements not to help (Weiner, Perry, & Magnusson, 1988).

A significant shift was work of Crandall et al. (2001), who developed The Attribution-Value Model of prejudice. The model can be applied across various cultures as they successfully demonstrated that prejudice towards members of groups (i.e., obesity) is determined by controllability, but also by an interconnected factor of cultural value for traits, characteristics, and stereotypic attributes about members of groups. (i.e., about fat) (Crandall et al., 2001). Since then, many other studies and researchers focused on the attributed controllability aspect of obesity, yet as argued below, perhaps the focus was unequivocal.

2.13.2. Sociofunctional perspective

The past theoretical approaches focused on the controllability of obesity as the main factor that predicts antipathy towards people with obesity and interpreted it within the framework of Attribution-Value model (Crandall et al., 2001; Leeuwen et al., 2015). Attribution Theory has proved to be able to explain that people who are held responsible (i.e., obesity is controllable) for their stigma, are eliciting higher levels of antipathy in others which by itself is extremely valuable finding (Crandall et al. in Brownell, 2005; Crandall et al., 2001). However, the literature review revealed that this approach has its limits.

First, it does not provide an explanation of why obese people are stigmatised while *underweight* are not (e.g., Leeuwen et al., 2015).

Second, the qualitative aspects of anti-weight stigmatisation (i.e., emotions) are often left behind, unexplained or ignore when the Attribution Theory is employed (e.g. Leeuwen et al., 2015).

Third, interventions based on Attribution Theory are often ineffective in reducing prejudice towards people with obesity (e.g., Daníelsdóttir, O'Brien, & Ciao, 2010).

Finally fourth, the Attribution Theory is insufficient in explaining complex causal models of stigma (i.e., models predicting positive or negative emotional and behavioural reactions towards people with obesity) (e.g., Levine & Schweitzer, 2015).

These limitations suggest that although controllability can predict weight bias, it is not the only predictor or mediator. Therefore it cannot explain all of the variability and searches for other factors explaining the weight stigma is warranted. These issues are addressed below by providing a contemporary theoretical framework of weight stigmatisation.

One of the reasons why changing beliefs about controllability is infective intervention is because there might be other factors that mediate formation of negative attitudes towards people with obesity (Daníelsdóttir et al., 2010; Wirtz et al., 2016). This does not mean that predicting obesity stigma and offering remedies through controllability is wrong, however, it is simply not enough and approaches that are using only at controllability as mediator are too simplistic.

Recent evidence (i.e., 2010 >) has focused attention on concepts such as disgust, contempt and anger to explain why stigmatization of people with obesity occurs (Lieberman, Tybur, & Latner, 2012; O'Brien, Daníelsdóttir, et al., 2013; Vartanian, 2010; Vartanian, Thomas, & Vanman, 2013).

Research has shown that disgust is especially important mediator in attitudes towards people with obesity (i.e., dislike of people with obesity at one side, association with concerns about appearance at the other side); (e.g., O'Brien, Latner, Ebneter, & Hunter, 2013), although until recently there wasn't an overreaching theoretical framework to explain disgust, and other novel emotions (i.e., fear, contempt, anger) in relation to previously used concepts within the Attribution Theory framework (i.e., controllability).

A new theoretical framework is offered by Leeuwen et al. where weight stigma is perceived through perspective of evolutionary psychology. Nonetheless, it addresses the limitations identified by Brownell et al. (see above); (Brownell, 2005; Leeuwen et al., 2015). Their framework takes recent findings in weight stigma (i.e., research on disgust, and other similar concepts) into account and applies it to an evolutionary psychological approach to stigmatization proposed by Kurzban and Leary in 2001 (see Kurzban and Leary, 2001 in Leeuwen et al., 2015) which uses Goffman's typology of stigma (see Goffman, 1963 in Leeuwen et al., 2015). Readers are suggested to review the article itself (especially Table 1) for details, however their main conclusion is that '*weight stigma is a stigma of both character flaw and abnormal appearance, sprouting from psychological mechanisms pertaining to dyadic cooperation and pathogen avoidance.*' (Leeuwen et al., 2015, p. 4). The idea is that weight stigma is unique because it has more than one underlying bias.

Goffman originally proposed that the typology of stigma is separated into three distinctive groups (see 2.12), whilst evidence of weight stigma as a 'tribal' stigma is minimal, 'body' (i.e., physical abnormality) and 'individual character' (i.e., character flaw) stigmas evidence are substantial (Leeuwen et al., 2015). As evidence does not support tribal stigma, only stigma as character flaw, and as physical abnormality are discussed further. Inspecting each of the stigma respectively, evolutionary approach (for further details see Kurzban & Leary, 2001) suggests that in case of stigma as physical abnormality the reason for social exclusion is to avoid pathogenic infection (i.e., obesity is associated with look commonly attributed to diseases), since people with obesity are perceived as source of pathogens.

On the other hand, in case of weight stigma as character flaw, the reason for social exclusion is avoiding costly dyadic cooperation (i.e., obesity is associated with lack of self-control and controllability which makes people with obesity appear as unpredictable) because person with obesity is perceived as poor cooperation partner. For details about supporting evidence see Table 1 in Leeuwen et al. (2015). The uniqueness of this approach is in its ability to merge individual concepts (i.e., controllability, and disgust) into broader theoretical framework that is tailored to weight stigma and give answers to why stigmatization occurs.

In support of this framework, recent evidence confirms the role of 'contempt' next to 'disgust' suggesting it should be considered (Wirtz et al., 2016). Wirtz et al. showed that contempt plays an important role in creating social distance between obese individuals and normal weight individuals, whilst disgust is more related to negative stereotypical intentions (Vartanian et al., 2013; Wirtz et al., 2016). This suggest that contempt could provide explanation towards behavioural aspects of stigma, and disgust to affective and cognitive aspects.

Considering this in relation to framework offered by Leeuwen et al. (2015), contempt might serve as cue to support obesity as a tribal stigma, since contempt seems to fuel avoidant behaviour (Leeuwen et al., 2015). Finally, Levine et al. (2015) demonstrated that obese people are also capable of eliciting sympathy and warmth in addition to negative effects (i.e., disgust); (Levine & Schweitzer, 2015). This is important as warmth may play important role in perceiving people with obesity as potential cooperation partners, thus mitigating weight stigma. However, Levine et al. approach stigma from the perspective of SCM (Cuddy et al., 2008) and BIAS Map (A. J. Cuddy et al., 2007), therefore it might be questionable whether their results translate into framework proposed by Leeuwen et al. (Leeuwen et al., 2015; Levine & Schweitzer, 2015).

2.13.3. Contact hypothesis and self-perception

The following section provides a further answer to a question about potential remediation of weight stigma. There has been some success at tackling weight stigma in previous research (e.g., Daníelsdóttir et al., 2010) by changing the social norms or social consensus in groups and applying multiple strategies (i.e., video and web-education, sharing information and such). However, other interventions (i.e., evoking empathy, changing beliefs about the controllability of obesity) were less encouraging (Daníelsdóttir et al., 2010). Interventions successful at mitigating other forms of prejudice (i.e., racial, gender) are underemployed by researchers in weight stigma (Alperin, Hornsey, Hayward, Diedrichs, & Barlow, 2014). One such intervention is contact hypothesis which was recently applied to weight stigma (Alperin et al., 2014).

The idea of Contact hypothesis originally developed by Allport (1979) is simplistic (i.e., mutual contact of opposing group members can mitigate (Allport, 1979). The results of applying contact theory as a reduction of weight stigma are mixed (Alperin et al., 2014).

The pattern that emerged when an overweight person (i.e., high BMI > 25 kg.m^2) was in contact with a non-overweight (i.e., low BMI < 25 kg.m^2) person was that the non-overweight person was affected negatively regarding their attitudes and behaviours towards their body (*negative* contact). The previous finding is problematic as the *positive* contact had only mild negative to neutral effects on attitudes and behaviours of low-BMI people towards their body.

However, a small positive effect was found in attitudes towards people with obesity. Ironically, while attitudes of low BMI people may potentially improve towards people with obesity in the positive contact instance, it may negatively or at best neutrally impact the non-overweight individual's attitude and behaviour towards their body (Alperin et al., 2014). Alperin et al. (2014) propose that reason for this effect is that obesity is perceived as 'joinable', malleable stigma, hence the low-BMI person has to face the fear of potentially becoming obese person themselves.

A theoretical answer to this paradoxical effect could be to use the contact theory for groups of low BMI people who have a positive attitude and behaviour towards their body with people who have negative attitudes and behaviour towards people with obesity. That would mean avoiding the high-BMI group altogether and with them the fear of becoming obese. Since

people with low-BMI are usually those who discriminate, the focus may be very well only at them (Schwartz et al., 2006).

Recent evidence suggests that self-perception plays an important role in prejudice towards people with obesity, i.e., people with negative self-perception (i.e., increased shame towards their body) tend to be more prejudiced than people with positive self-perception (Tomiyama, 2014). Therefore, utilising the fact that some low-BMI people have positive self-perception can potentially influence negative self-perception of 'prejudiced' low-BMI group. This theoretical assumption would have to be studied further. However, a potential intervention could be offered by applying the Imagined Contact within the framework of Contact hypothesis (Crisp & Turner, 2009).

Recent work of Turner, Wildschut and Sedikides, (2012) in this area offers a potential intervention through the use of recalling nostalgic memories. Whilst their findings have an intervention potential as nostalgic memories successfully reduce weight stigma, this line of work remains understudied (Turner et al., 2012).

2.14. Discrimination based on weight stigma

Stereotypes and prejudice are intrapsychic phenomena; discrimination is a behavioural response (i.e., observable) (Fiske et al., 2010). Therefore, discrimination tends to be also accounted as an empirical evidence of prejudice and weight stigma (O'Brien et al., 2008). This is rather an important remark on which the current study relies. O'Brien (2008) tried to use standard measures (i.e., IAT, direct measures of weight stigma) to see whether they predict an actual discriminatory behaviour (O'Brien et al., 2008). Since the methods employed in their study were not significantly predicting discrimination, their solution based on empirical evidence is to use comparative designs (i.e., comparing obese, normal weight HCPs), as this is the basis at which discrimination occurs most often (O'Brien et al., 2008). Nonetheless, successful attempts that were able to provide evidence supporting link of explicit predictors (self-report scales) and an actual discriminatory behaviour also exists (O'Brien, Latner, Ebneter, & Hunter, 2013).

The current study employs an approach suggested by O'Brien (2008), using a comparative design when assessing discrimination behaviour towards HCPs. It is crucial though that previously discussed concepts related to weight stigma are considered as they are providing the underlays, both theoretical and practical, for discriminatory behaviour. The present section

focuses on examples of discriminatory behaviour towards obese people, particularly in healthcare settings and towards HCPs.

Weight discrimination is prevalent across wide range of settings, although with varying strength of evidence. The following paragraph does not aim to be exhaustive list of all settings, instead it should merely illustrate the current status of knowledge about the obesity discrimination. So far the most documented area of weight discrimination has been the workplace setting, followed by mass-media, healthcare, educational, and interpersonal settings respectively (Puhl & Heuer, 2009). The common expressions of such discrimination are:

a) When the employment setting is considered, evidence suggests that discrimination occurs in domains of hiring, promotion (i.e., fewer opportunities), worse pay scales, worse pay sales, lower professional and career success, and lower customer service in a *workplace setting.* As illustrated by Giel, Thiel, Teufel, Mayer and Zipfel (2010) who gathered the evidence from more than 20 studies between 1979 – 2010 . Additional evidence for discrimination at workplace setting comes from experimental designs, such as the one conducted by Flint, Čadek, Codreanu, Ivić, Zomer and Gomoiu (2016), which examined the impact of workplace activity level on hiring decisions of candidates with varying weight in a sample of 181 participants (Flint et al., 2016). The weight stigma biased the hiring process, i.e., applicants who were obese were less likely to be hired, which was further modified by gender and activity level at workplace (i.e., higher demanding workplace lead to less likelihood of being hired if candidate was obese, and even less likely if they were female); (Flint et al., 2016). Additional evidence is provided in a systematic review by Puhl et al. (2009).

b) Discrimination in media settings has slightly different form as often it may be part of reality shows, TV discussions and such. A good anecdotal example is practically any discussion of Ms Katie Hopkins on the topic of weight, who does not think twice to stigmatise people with obesity openly, despite the fact that they are sitting in front of her (see This Morning - Katie Hopkins and Jay Cole Interview, 2013). The above example might be a good illustration, however, more formally, the most recent evidence is from a literature review on this topic by Ata & Thompson (2010) who gathered data from studies between 1994 and 2009. Ata & Thompson (2010) focused on media more broadly, since they covered evidence not just from TV shows, but also from internet, books, magazines, movies and such. More

importantly, they also covered evidence from media that are typically targeting young children (i.e., cartoons), and adolescents (i.e., YouTube) which might be especially important, e.g., for reinforcement of particular norms in early age (Ata & Thompson, 2010). Weight stigmatisation was accruing in all sources they covered with one exception. The exception were children's situation comedies which portrayed obese characters more realistically in comparison to other sources. Otherwise the evidence was negative, for example animated shows portrayed obese characters three times more likely as physically unattractive than normal weight characters; obese characters in books were often portrayed as possessing negative traits; situation comedies and movies for adults portrayed obese people as having less contact with their peers and were less attractive than their normal weight peers; or to name the last example, videos on YouTube that involved fat stigmatization were rated as positive, highly viewed and liked (Ata & Thompson, 2010).

c) Concerning the educational setting, a recent meta-analysis by van Geel, Vedder and Tanilon (2014) which contains an analysis of 28 studies about bullying of obese and overweight youths documented this issue in detail. Their study focuses on the bullying of overweight youth, and at the bullying of obese youth. When van Geel et al. (2014) computed odds ratio of all articles in both overweight and obese groups, results showed that overweight group was 1.19 (CI 1.10–1.29) more likely bullied that non-overweight youths, and the obese group even 1.51 (CI 1.34–1.72) more than normal weight youths. These results illustrate how prevalent is discrimination (i.e., bullying) of children in an educational setting. Additionally, evidence by Puhl et al. (2009) shows that weight discrimination is prevalent also in other domains of the educational setting. Evidence by Puhl et al. (2009) shows that obese students are also discriminated from educators themselves. Moreover, the educators endorse weight stigma, and weight stigma creates disparities between obese and normal weight students (i.e., lower chance of attaining higher education). However, Puhl et al. (2009) suggest that more evidence is needed in the area of educational setting due to the existence of studies that do not report any disparities between obese and normal weight students (Puhl & Heuer, 2009).

d) Swami et al. (2008) conducted two studies which reported that others perceive obese and overweight people as lonelier (Swami et al., 2008). While few studies exist on this issue, evidence provided by Chen et al. (2005) and Puhl et al. (2009) shows that obese people are perceived as less attractive, and less desirable as sexual partners (Chen & Brown, 2005; Puhl & Heuer, 2009). The findings that obese partners are less desirable was discovered by Chen and Brown (2005) who recruited 449 students and asked them to rank six drawings of potential sexual partners. However, a caution should be taken as such study is likely to suffer from ecological validity. It has to be considered that only pictures were shown and that asking participants to rank the stimuli from least to most preferred is a rather outdated measure of weight stigma prone to bias. Finally, although their study was assessing only female participants, Seacat, Dougal, and Roy (2016) asked 50 overweight and obese women to record a diary of their experiences for a week. Results of their study provide evidence that as participants engaged in more frequent interpersonal interactions, so did increase the frequency of experienced weight stigmatisation. Such interactions often occurred at public places, and also at private, e.g., partner's house and such (Seacat et al., 2016).

e) Discrimination in healthcare setting occurs in multiple domains. Patients can experience it. However the same applies to HCPs, and even a place (i.e., waiting room, medical facilities) might be something that is the reason for discrimination. There are multiple studies on this topic. However, possible the most recent evidence in this section will be from a literature review conducted by Phelan et al. (2015) who gathered evidence from around hundred resources that explain the impact of weight stigma on quality of care (Phelan et al., 2015). Importantly, Phelan et al. (2015) also warn that it is *not* implied that discrimination towards obese patients is intentional from the side of HCPs, this is not the conclusion as HCPs are simply suffering from weight stigma the same way as the general population, despite their best intention to help their patients. Common discriminatory behaviour that occurs from side of HCPs is, for example, spending less time with obese patients, less time educating them about their disease (Phelan et al., 2015), or being reluctant to perform certain exams (e.g., pelvic exams) on obese patients (Schwartz, Chambliss, Brownell, Blair, & Billington, 2003). Such relationship impacts patient adherence to medical care, specifically the non-adherence is 19% higher, there is mistrusts, and patient weight loss outcomes are worse when such relationship between HCPs and patient with obesity occurs (Phelan et al., 2015). For additional evidence on communication, see section 2.8. *Contributing factors – Social*

norms where a study by Richard et al. (2014) was discussed. A Recent literature review from Forhan and Salas (2013) who reviewed published literature from past 20 years, demonstrated that there are numerous instances where weight discrimination of obese patients occurs (Forhan & Salas, 2013). The particularly important conclusion of their review is that the weight discrimination often has damaging consequences to obese patients, i.e. patients who are in need of medical procedure (such as bariatric surgery) are declined by HCPs because the HCPs apply more restrictive risk-benefit criteria on obesity interventions (Forhan & Salas, 2013). Additional evidence of discrimination in healthcare setting comes from a literature review by Puhl et al. (2009) who found evidence that '*Obese patients perceive biassed treatment in health care;* and that *weight bias negatively impacts health-care utilization'* (Puhl & Heuer, 2009, p. 948). Whilst this illustrates nicely overall situation in healthcare, it lacks the perspective of discrimination towards obese HCPs. This gap in the literature is considered below.

While there are numerous instances of discrimination towards obese patients, the literature on discrimination towards obese HCPs is relatively scarce, and the topic is understudied. Review of published studies on this topic gathered eleven studies that were discussing the weight status of HCPs. While weight status is certainly interesting, the focus of this study is how HCPs weight status affects the way their patients perceive them. Therefore, only seven studies out of eleven were focusing on this issue specifically (Hash, Munna, Vogel, & Bason, 2003; Hicks et al., 2008; Lovell, Parker, Brady, Cotterill, & Howatson, 2011; Geoff P. Lovell, 2012; Lubker, Visek, II, & Singpurwalla, 2012; Puhl, Gold, Luedicke, & DePierre, 2013; Asimakopoulou, Ignatius, While, & Newton, 2015).

First discovered study that was published on the topic was a research by Hash et al (2003). Their study was a quasi-experiment (i.e., participants were not randomly assigned to HCP; rather, they were already patients of particular HCP) which involved sampling patients near 5 HCPs offices (i.e., 2 obese male HCPs, 3 normal weight both male and female HCPs). Overall, their sample consisted of 226 patients.

Each patient was given a 43-item survey which evaluated patient's satisfaction with the HCP. Results of their study were that patients who were consulting with normal weight HCPs indicated greater confidence in the medical advice they have received in comparison to patients in normal weight HCP condition.

Although the study findings are promising, the study suffers from few limitations. First, patients who were evaluating their doctors could have been susceptible to various biases that were left uncontrolled due to non-experimental nature (e.g., researcher bias, social desirability bias) and more importantly, second, the obese HCPs were older (38 – 43 years) males, therefore gender was not controlled (Hicks et al., 2008).

Additionally, the advice HCPs were giving was also an uncontrolled factor and finally, the study did not use any standard measures of weight stigma. Therefore, they did not know anything about the prejudice of participants towards obese people.

Study by Hicks et al. (2008) was another that was reviewed. The study used quasi-experimental design (i.e., no control for gender of HCP, weight stigma of participant, and purpose of the study was obvious) and used a questionnaire to survey 150 (89% were students) conveniently sampled participants near university campus (Hicks et al., 2008).

The participants task was to view a 3D model of obese nurse printed on a paper. The model was created from http://myvirtualmodel.com/. The participants then had to assess how confident they would be in receiving a medical education from such nurse on a visual scale from zero to ten.

The difference between confidence in medical advice was significant, i.e., participants were less confident about the information given from obese nurse in comparison to normal weight nurse.

While this effect was significant, the participants often stated that they had not enough information about the nurse, e.g., what kind of information she is providing, how qualified or what is her qualification and such. In other words, the stimuli were not convincing, or real enough. Additionally, the study did not compare for potential difference in gender of HCPs and researchers did not gather enough sociodemographic data (i.e., BMI, income, ethnicity).

Additional evidence comes from studies conducted in sport psychology and sport nutrition fields. The studies discussed below are loosely related to the current study as their goal was to provide an evidence on a particular sample of population (i.e., athletes), therefore, their findings may not be applicable to a general population (i.e., athletes in contrast to general population may have different motivation and expectation).

Lovell et al. (2011, 2013) conducted studies that examined the impact of female sport psychologist's and female sports dietitian's characteristics on athlete's perception of their

potential effectiveness. Neither of the studies considered to explain their results with relevance to weight stigma, however, this direction is warranted as weight stigma could be a potentially significant covariate.

Lovell, Brady, and Cotterill (2011) recruited 233 athletes who evaluated pictures of Female Sport Psychologists with different BMI levels wearing either formal or sport attire. The results demonstrated that athletes perceived as more effective, and preferred to work with normal weight psychologist, who was wearing a sport attire in comparison to obese psychologist, and formal attire (Lovell et al., 2011). These findings were not controlled for different gender of the psychologist as there was only a female. Additionally, female athletes rated the psychologist more positively.

Lovell, Parker, and Slater (2013) conducted an additional study of the sports dietitian's characteristics on athlete's perceptions of their potential effectiveness. The study design was rather similar to the previously mentioned study. The study involved one hundred athletes who rated the pictures of sports dietitians. The exception from 2011 study was a different profession of HCP. Results showed that as the BMI of female dietitian decreased, the athletes perceived them as more effective, and were more likely to work with them(Lovell, Parker, & Slater, 2013). The attire was also a significant predictor, i.e., sport attire was perceived more positively.

None of the studies by Lovell et al. (2011, 2013) explained their findings with relevance to weight stigma. However, their findings consistently showed that obese HCPs were perceived less positively and less effective when being rated by athletes. The explanation that its partly due to weight stigma is warranted by the review of literature (see section 2.11.) that showed an association between weight stigma and low BMI (i.e., athletic people).

Puhl et al. (2013) study assessed how a perceived weight (i.e., either obese, overweight or normal weight) of physician predicts participants (i.e., potential patient) trust, advice adherence, physician selection, and physician compassion. The study sampled 358 adult participants into an online experiment where participants were assigned into three conditions.

Participants read a description of physician, however the physician was either labelled as obese, overweight, or normal weight. Afterwards, participants rated physician on several scales. The study also assessed participant's levels of Fat phobia as measured on the F-Scale (Puhl et al., 2013).

The results showed that respondents were more likely to follow a health care advice from normal weight HCP in comparison to other weight categories. Additionally, the linear regression identified several significant predictors. Both Obese and Overweight condition showed significantly negative prediction of all scales. The only non-significant prediction was between overweight HCPs and compassion scale. As the weight of HCPs increased, the scores on compassion, trust, selection and advice adherence decreased. On top of that, if the participants had higher anti-fat attitudes, the likelihood of selecting obese HCP were lower, and the same applied for adherence of medical advice, trust, compassion, and credibility. The trend reversed if the condition was with a normal weight HCP (Puhl et al., 2013).

The study by Puhl et al. (2013) had several limitations. First, the results do not show how would the weight bias and score on scales change if the information given by HCP varied. Additionally, the stimuli used in the study is simply a text that described a HCP of particular weight which may have lesser ecological validity since normally, this is not an information written explicitly. Finally, the study did not explore whether female HCPs would elicit different levels of weight stigma from male HCPs. These limitations are addressed by the current study.

The study by Asimakopolou et al. (2015) recruited 302 undergraduate and postgraduate student participants. Participants were blind to the true nature of the study and received a gender matched picture of either obese, or normal weight dentist (i.e., female participants had female dentist). Subsequently, participants rated on a 5 point Likert scale if they believed that dentist was competent, professional, caring, had patients' best interests at heart, and was a good dentist (Asimakopoulou et al., 2015).

Contrary to previous findings from Puhl et al. (2013), results showed that almost all obese dentists did not receive less positive rating than normal weight dentists. The only exception was that participant rated normal weight dentist as more caring than the obese dentist. The authors concluded that dentists are protected from the effect of weight stigma.

The study by Asimakopolou et al. (2015) has some limitations, namely the study did not address potential covariates on side of participants when analysing data. Surprising is that authors did not use any of available scales to measure weight stigma (e.g., F-Scale, BAOP, ATOP, and such) that are traditionally used in the discourse od weight stigma studies. As authors themselves note, the pictures were on vignettes of lesser quality, therefore the stimuli may not have been convincing enough. Lastly, the study did not assess whether the scales would have different results if HCPs would have different gander.

In summary, following limitation were identified within reviewed studies a) in most cases the studies used only photographs or images of people, which result in less realistic situations (Asimakopoulou et al., 2015; Puhl et al., 2013; Lovell, 2012; Hicks et al., 2008; Lovell et al. 2011); b) studies using real practitioners lacked the aspects of experimental study, did not used additional measures to assess weight stigma, HCPs characteristics changed only in one variable, i.e., obesity, non-obesity (Hash et al., 2003); c) studies did not compare different medical professions (e.g., general practitioner and dentists) but only one (Puhl et al., 2013), d) studies did not use additional measures of weight stigma and if they did, HCPs characteristics changed only in one variable, i.e., obesity, non-obesity (Puhl et al., 2013).

2.15. Quantifying weight stigma

Daníelsdóttir et al. (2010) reviewed articles aimed at reducing weight stigma concluding that there was a major inconsistency in the choice of measures used to assess stigma. The current field lacks a systematic review that would evaluate measures of weight stigma based on their psychometric quality and propose recommendations to develop a measure that are psychometrically sound and which might be recommended to obesity researchers (Alberga et al., 2016).

Since the 90s there were only two attempts to summarise current measures of weight stigma and both appeared as chapters in different editions of the Handbook of Assessment Methods for Eating Behaviors and Weight-Related Problems: Measures, Theory, and Research (Allison, 1995; Allison, 2009). Both chapters listed over thirty possible measures of weight stigma assessment, and recommendation in the newer edition can help researchers in deciding what measures to use (see Chapter 3 in Allison, 1995; Allison, 2009).

However, serious limitations exist: a) the edition from 1995 is outdated; b) its use is not recommended due to the list of measures in newer edition is not exhaustive; c) measures only until 2007 are included, hence summaries lack measures that are newer and reflect recent developments (e.g., O'Brien, Latner et al., 2013; Ward-Smith & Peterson, 2016); and d) the summaries cannot supply a need for full-fledged literature review such as DePierre and Puhl (2012).

Due to these limitations and lack of any literature review in the field, researchers may have difficulties while deciding which measures are the most suitable for their purpose, and it is far beyond their time possibilities to review all measures every time the construct a study.

2.15.1. Indirect measures

Methods for measuring prejudice in the context of the following research can be split into two distinguishable categories. The first group of methods is measuring implicit attitudes and the classical examples are the IAT (Greenwald, McGhee, & Schwartz, 1998) or priming (Fazio, Jackson, Dunton, & Williams, 1995). The name "implicit" often suggests that the subject is unaware of their attitudes or that they are being assessed, but such claims have never been scientifically proven and in reality the implicit measure means that the respondent is simply not asked for attitude self-assessment (Nelson, 2009). Over the years this term acquired many connotations and for this reason we will address this issue by using term "indirect" measures (Nelson, 2009).

The first representative of indirect measures is IAT (Greenwald et al., 1998). IAT relies on the interpretation of its dependent variable which is response latency. If the response latency between two categories (i.e., fat and bad) is short, then the association between them is strong. In general, the measurement is between categories of attitudes and values. If the response latency is long, then the strength association between the categories is weak. It is worth noting that there is a reason to be sceptical in what exactly the IAT measures or to be more specific, whether it is a useful predictor of behaviour.

A recent meta-analysis found important evidence suggesting that the IAT is a poor predictor of prejudicial behaviour (Oswald, Mitchell, Blanton, Jaccard, & Tetlock, 2013). Finally, the problem with such categorization is that the IAT's results were proved to be influenced by extrapersonal associations which are information available in memory but not related to attitude itself (Fazio & Olson, 2003). Another option in measuring attitudes indirectly is to use priming (Cameron, Brown-Iannuzzi, & Payne, 2012).

Priming is another form of indirect measure and its theoretical principle stems from the sequential priming that was originally used in memory research (Herring et al., 2013). The principle behind priming as proposed by Fazio et al. is that after showing first (i.e., prime) and second stimuli (i.e., target) in pairs, if the prime (first) is evaluatively congruent (e.g., bad) with the target (e.g., adjective word 'repulsive'), then participants' responses are faster (Fazio et al. in Herring et al., 2013). The reaction times are the dependent variable as they were dependent variable in IAT (Nelson, 2009).

Although priming measures do not suffer from extra-personal influences they are often criticized for reliability issues as any variation in types of primes target or subjects produce different results (Nelson, 2009).

While it is possible to provide a much deeper theoretical review of indirect measures, the current study does not rely on them, hence even such basic introduction is justifiable. However, it is encouraged that reader visits the Project Implicit webpage (https://implicit.harvard.edu/implicit/) founded by Greenwald, Banaji and Nosek (1998) to gain an insight into how indirect measures (i.e., IAT in this case) operate.

2.15.2. Direct measures

The second group of methods can be identified as the explicit measures of attitudes. To remain consistent with previous section, they are addressed here as 'direct' measures which essentially means that the respondent is asked to self-assess their own attitudes. For this purpose, there are various questionnaires (scales).

Whilst direct measures are relatively easy in administration, evaluation, and they usually do not take too much of participant's time, the negative side of these measures is that the respondent can be influenced by social desirability effects, thus confounding the results.

Measures selected in the current study are commonly used in the field and recommended by other researchers, however, there are limitations as mentioned in the introduction to this section (Allison, 2009; Daníelsdóttir et al., 2010).

According to Ruggs, King, Hebl and Fitzsimmons (2010) there are four methods of measurement the weight. The method in the current study relies on surveys that are administered to participants. While these are rather easy to administrate, there are potential issues with self-report measures, namely that they are biassed, and causality between these measures and actual discrimination often cannot be inferred (Anselmi, Vianello, & Robusto, 2013; O'Brien et al., 2008; Ruggs et al., 2010).

Furthermore, there is a potential issue that participants can be influenced by factors outside the researcher control (i.e., anchoring), although that is more relevant to weight bias reduction and intervention studies (Carels et al., 2015).

These limitations are not possible to avoid; these measures are selected here as they are intuitive to participants, which reflects the online nature of the current study.

2.16. The aims of the current research

The current study aims to address all of limitations that were present in previous studies by providing a more convincing stimuli, assessing different characteristics of HCPs (i.e., gender and information they are giving) and at the same time use a blinded study with a random assignment to conditions.

Current study will also sample relevant sociodemographic characteristics (i.e., especially BMI, Age, Gender) and use traditional measures to assess weight stigma (i.e., ATOP, BAOP, F-Scale).

The main research aims are to provide an evidence on how is the weight stigma influenced by various factors, especially gender of HCPs, the information they are providing, their weight status, and other relevant sociodemographic characteristics on the side of a participant. Furthermore, the current research will also address whether amount of information participant remembered was different across conditions (i.e., recalled advice) which could provide valuable information for interpretation of results. The current aims reflect gaps in previous literature.

3. Method Section

3.1. Aims of this research

Following research questions and hypotheses reflect literature review conducted prior to the method section. For further understanding of limitations that were found in recent research on weight stigma towards HCPs.

Research aims

I.   Are HCPs with obesity stigmatized by their potential patients?
II. Is weight stigma influenced by gender, and information the HCP offers?
III. What sociodemographic characteristics of participants are associated with weight stigmatization of obese HCPs?
IV. Does weight stigma towards obese HCPs affect remembering of medical advice in comparison to normal weight HCPs?

Hypotheses

Research aims above are transferred into following hypothesis that are going to be evaluated in the results section.

- **H1**: Participants who viewed the obese HCP, reported significantly more weight stigma than those who viewed the normal weight HCP
- **H2**: H2: The weight stigma will be higher in the obese HCP condition when discussing obesity compared to the obese HCP condition when discussing stress and the normal weight HCP conditions when discussing stress and obesity.
- **H3**: The HCP with obesity will be eliciting higher patient non-adherence, lesser professional credibility, lower patient's trust, lesser likelihood of being selected by potential patients, and lesser compassion as perceived by potential patients
- **H4**: Patients being addressed by the HCPs with obesity will remember less of medical advice than patients with the normal weight HCPs.

3.2. Participants

The sample was collected from general population through internet platform using direct invitations via email, social media sites (i.e., Facebook, Twitter), advertisement, crowdsourcing platforms (i.e., Prolific), and sites listing online studies (i.e., Call for Participants, Social Psychology Network).

Nonetheless, with exception of Prolific the resulting sample is convenient. Although the initial collected sample consisted of 103 participants, applying exclusion criteria to the sample resulted in final sample of 82 participants.

Reaching a representative sample from general population is very unlikely without funded research. In such cases where funding is unavailable, there are two options: 1) framing the target population differently; or 2) admitting that the sample will include coverage errors and generalization is limited (Groves et al., 2004). While the collected sample may suggest links between weight stigma and various attitudes towards HCPs, it is unlikely that a sample of this size can be generalized.

Following restriction criteria were applied, participants had to be at least 18 years old but no more than 55 years old, their occupation could not be a HCP (i.e., also nursing and such) or a medicine student, nor a psychologist and student of psychology.

The age restriction was a maximum of 55 years for the following reasons. It is an established fact that memory declines with age, also the difference between 18 years old and 60 years old adults is roughly 1 SD. In order to minimize this difference, the study aimed for slightly younger sample and ceiling limit was therefore age of 55 years (Salthouse, 2009).

Participants that were non-fluent English speakers were also excluded, however, in this case this was achieved through rigorous pre-screening of participants. Thus, anyone who did not speak fluent English was unlikely to have an access to the study.

Finally, people that were enrolled in a weight loss programme or were consulting their diet with dietitian over last 14 days and people that had any experience with psychologist, were also excluded from experiment.

Preliminary estimates of required sample

Prior to data collection, sample size was estimated using the G*Power 3.1.9.2 (Faul, Erdfelder, Lang, & Buchner, 2007). A full model was considered to estimate the required sample size for primary analysis (i.e., MANOVA with special effects and interaction). To achieve a precise estimate of required sample size, it is either nescessary to have preliminary data or generate a preliminary dataset using random sampling based on estimated parameter values such as mean and standard deviation or assume an effect size.

In this case, a medium effect size of 0.06 was assumed in order to carry on power analysis for $\alpha = .05$ and following parameters Group: Advice (2) x Gender (2) x Weight (2) = 8; Predictors:

Advice, Gender, Weight, ATOP, BAOP and FScale = 5; and Response variables: AHCP (7 scales), and RAQ (1 scale) = 8. This setting estimated a required sample size of 138 participants in order to reach $\alpha = .05$. Protocol of full power analysis is below:

F tests - MANOVA: Special effects and interactions	
Options: Pillai V, O'Brien-Shieh Algorithm	
Analysis: A priori: Compute required sample size	
Input	
Effect size f²(V)	0.06
α err prob	0.05
Power (1-β err prob)	0.95
Number of groups	8
Number of predictors	5
Response variables	8
Output	
Noncentrality parameter λ	41.4000000
Critical F	1.4133702
Numerator df	40.0000000
Denominator df	635
Actual power	0.9507992
Pillai V	0.2830189

(Faul et al., 2007)

3.3. Materials

The current study used a number of video stimuli in order to imitate a medical consultation between HCPs and their patients.

Since the study used conditions (see procedure section 3.5.) with varying gender, it was necessary to recruit two actors, i.e., male and female. These actors were both native English speakers, relatively same age (i.e., 25 – 30), height, body type and Caucasian.

Actors were given scripts prior to recording session (i.e., to familiarize themselves with it) with information either about weight management, or stress management advice. These scripts were using information from the NHS Healthy Choices website and were structured so that they had equal amount of words see appendix for scripts. Reading time of one script was approximately 4 minutes.

On the recording day, both actors wore a casual white t-shirt and trousers and read the script from teleprompter. The recording was done in front of a green screen which was later used for post-editing process.

After initial recording, footage was send to a visual artist who changed the background and modified body weights of both actors. The bodies were from different pair of obese actors who were recorded in order to arrange the body swap. The manipulation resulted in eight different videos. Below is sample picture of the stimuli respondents saw.
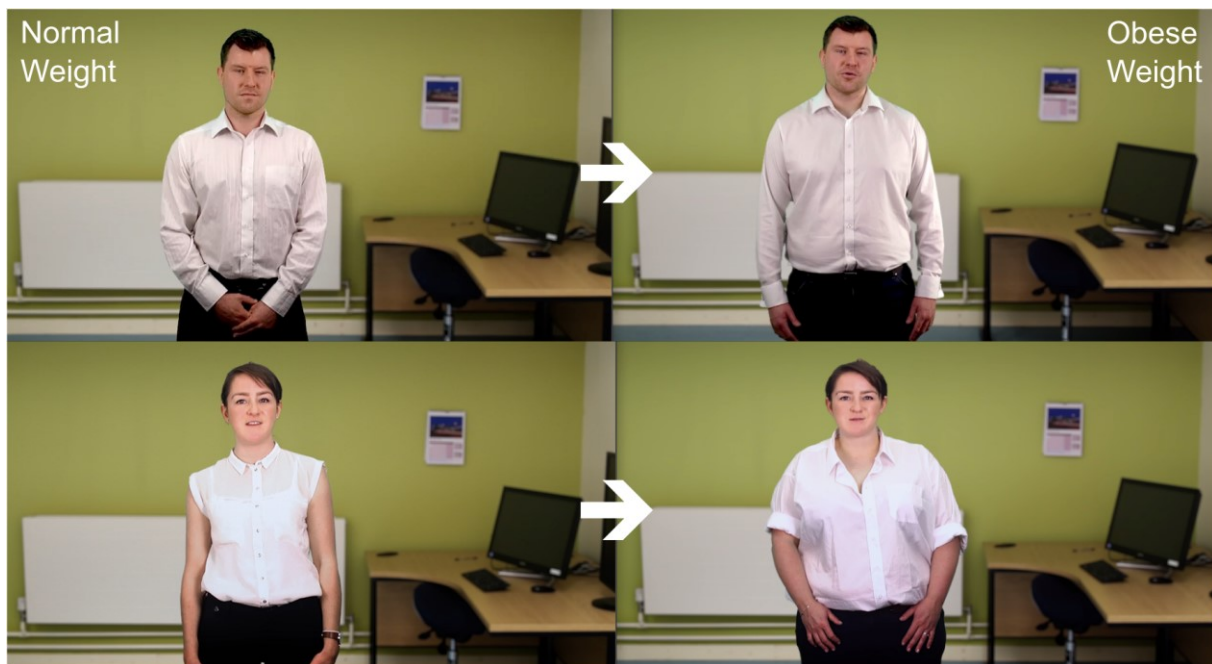
Videos were afterwards uploaded to Qualtrics online platform, i.e., https://shusls.eu.qualtrics.com/SE/?SID=SV_d7sA2XeUTUDTaQJ and distributed into appropriate conditions.

Final version of the video had on average 4 minutes, and was reviewed by actors and researchers for quality. Slight differences between videos (e.g., pauses in speech or technical glitches) were removed in post-production.

3.4. Measures

The scales used in the current study were the Attitudes towards Obese Persons and Beliefs about Obese Persons (BAOP and ATOP; Allison et al., 1991) and the F-Scale (Bacon, Scheltema, & Robinson, 2001).

The BAOP is a six-point Likert scale (-3 to +3) with eight items while ATOP has twenty items on the same scale. The ATOP Cronbachs alpha ranges are 0.80 – 0.84 and BAOP ranges are

0.65 – 0.82 (Allison et al., 1991). Whilst the BAOP alpha is satisfying, recent research indicates that BAOP often falls below the recommended cut-off values of 0.7, and its reliability is questioned (Ruggs et al., 2010). Researchers sometimes use only the ATOP, yet since both measures benefit from being administered simultaneously as the ATOP measures construct of prejudice, and the BAOP measures construct of stereotypes. Thus, omitting the BAOP may lead to the loss of valuable research information (Allison et al., 1991; Ruggs et al., 2010).

The ATOP asks participants to evaluate how much they disagree of agree with each of the 20 statements (e.g., *Obese people are as happy as nonobese people*). Higher scores on ATOP reflect positive attitudes towards people with obesity. Negative items are reversed, and once the responses to the items are summed, 60 is added to the total and scores range between 0 and 120.

The BAOP asks participants the same using 8 items (e.g., *Obesity often occurs when eating is used as a form of compensation for lack of love or attention)*. However, the concept measured by the scale is to what extent people believe that obesity is a controllable condition. Higher scores of BAOP represent belief that obesity is *not* under personal control (Allison et al., 1991). Negative items are reversed, and once the responses to the items are summed, 24 is added to the total and scores range between 0 and 48.

Since their development, both the ATOP and the BAOP have been used extensively by other researchers (the original article by Allison et al. yielded 104 unique citations in Web of Science) and have been applied to large population-based samples (e.g., Hansson & Rasmussen, 2014). Whilst this is an indication of consensus use of the BAOP and the ATOP, there are certain limitations in these measures that are overlooked by researchers.

First, the original sample that was used to validate this study was composed of mixture of students (total N = 124), compared to different subsamples from clinical population (total N = 514). The idea was to illustrate similarities and differences between these two samples, however, the scale was never standardized on population based samples, hence we lack the norms for national samples (e.g., Hilbert et al., 2014). This is critical since there are instances where the scales were already used to measure attitudes across a general population (Hansson & Rasmussen, 2014). Furthermore, each of the subsamples for the ATOP should have been at least 20x10 if only general rules of thumb are applied to estimate the sample size, meaning that the ATOP validation was under sampled and Factor Analysis should not have been considered.

Additionally, since the authors do not provide loadings, it is not possible to confirm whether, at least theoretically, the assumptions of Principal Component Analysis (PCA) should have been relaxed (Hof, 2012; Tabachnick, Fidell, & Osterlind, 2001).

Finally, whilst the authors state that the factor structure was assessed, the PCA was the method of their choice. PCA is not a Factor Analysis and is not suitable method for validation of questionnaires, therefore if authors discovered anything at all given the sample restriction, then these were components, not factors (Hof, 2012). These are serious limitation, nonetheless the BAOP and the ATOP appear to be the most psychometrically evaluated measures up to date.

The revised F-Scale is a method to measure weight stigmatization (Bacon et al., 2001). The full name of the scale is the Fat Phobia Scale which was its original name when the scale was first introduced in 1984. However, due to its pejorative name, and its length (50 items originally), the scale was revised in 2001 and so the shortened version was developed (Bacon et al., 2001).

The F-Scales has excellent Cronbach alpha of 0.91 and includes 14 items. The scale is cited often (i.e., original article by Bacon et al. yielded 72 unique citations in Web of Science), and has been used to assess attitudes on national based samples (e.g., Puhl & Liu, 2015). The F-Scale asks participants to choose between two adjectives (e.g., lazy: industrious) on 5-point scale. Participants therefore select the adjective that is the most fitting description of people with fatness. The scale measures negative attitudes towards people with obesity (i.e., fat phobic). Scores above 2.5 indicate more negative attitudes towards people with fatness (Bacon et al., 2001).

After the responses are collected, negative scales are reversed and summed scores are divided by 14. The final score can range between 1 to 5.

The revised F-Scale was standardized on sample of 255 people of which 98% were females. Whilst the scale does not suffer from under sampling, a sample comprised mostly of females could potentially have different results on males. Finally, the limitation regarding the use of PCA (see section above) used in the paragraph about the ATOP and the BAOP also apply here (i.e., PCA does not produce factors).

In addition to above measures, international physical activity questionnaire (IPAQ) was used to measure physical activity was used (IPAQ Group, 2001). The questionnaire allows to categorize a person's activity into either a low, medium or high group. However, the questionnaire itself was not used in any analysis, therefore is not discussed here any further.

Attitudes towards HCP questionnaire (AHCP)

Additional questionnaire was developed in order to measure patient's attitudes towards HCP. Previous research has already tackled with this topic, specifically the starting point of questionnaire development was a study by Puhl et al. (2013) which was already reviewed in 2.14.

In order to develop *Attitudes Towards HCP* (AHCP) *Scale* the Web of Science was used to search for measures that assess patient's opinion about HCPs. The AHCP therefore reflects previous efforts to build similar measures. The first step was to create several categories, or groups of HCP's characteristics, into which items could be generated.

Previous researchers were measuring following categories: likelihood to follow the health advice, competence/professionalism, trust, perception of professional credibility, attractiveness, health behaviours of doctor, likelihood of selecting particular HCPs (often differentiated by body size), compassion, HCP general appearance and reputation, HCP physical characteristics, HCP likeableness, patient perception of advice for weight and fitness (Asimakopoulou et al., 2015; Hash et al., 2003; Puhl et al., 2013).

Selection of appropriate categories was done in lines with previous research done by Puhl et al. (2013) who used subscales measuring attitudes towards HCP's health **behaviour**, their likelihood of being **selected**, their **compassion**, **trust**, and finally a general **advice adherence**.

For purposes of current study, the category of trust was separated into two categories (i.e., trust, and **credibility**), and category of impression about the HCP was added. The last category was supposed to measure stereotypical attitudes towards HCP (e.g., whether they seem lazy, sloppy).

Generating items

The items come in part as modified versions from previous studies on this topic, however in most cases they needed to be significantly changed (Asimakopoulou et al., 2015; Puhl et al., 2013).

In addition, several questionnaires that are commonly used with regards to patient satisfaction scales were reviewed in order to see whether any items could have a relevance in the current research. Specifically, following questionnaires were reviewed: **MISS** (Wolf et al, 1981 in Kinnersley, Stott, Peters, Harvey, & Hackett, 1996) , **CSQ** (Baker, 1991), **CEP** (Wensing, 1998), **EUROPEP** (Grol, 2000), **IPQ** (Greco, 2003), **PSS** (Nelson, 2004); (see in Evans,

Edwards, Evans, Elwyn, & Elwyn, 2007). From the above mentioned, we have used modified version of items from **MISS**, **CSQ** (Kinnersley et al., 1996), **GPAQ-R** (Roland, Roberts, Rhenius, & Campbell, 2013), **IPQ** (Greco, Powell, & Sweeney, 2003)**.**

The novel, impression scale was developed out of stereotypes that are commonly used to describe people with obesity. Examples are being lazy, frequently overeating, being unintelligent, lacking self-discipline, having poor hygiene, being less competent and more socially warm, being sloppy, and finally having lower social status (Puhl et al., 2008; Vartanian & Silverstein, 2013).

Final questionnaire included seven subscales that were measuring patient's opinion about HCP's **healthy behaviour**, HCP's likelihood of being **selected**, **compassion**, **trust**, patient's **advice adherence,** and impression about HCP. Each scale had 5 items with exception of trust which included additional items (i.e., two) that were specific depending on the condition where AHCP questionnaire was used (i.e., if stress, then questions asked about stress related situation).

Each item was on four-point scale from strongly disagree – disagree, to agree – strongly agree. The questionnaire in its final form included only five items per scale, therefore each scale could have maximum of 20 points. Higher scores indicated a better opinion about HCPs. For example, a higher score on trust scale indicated that HCP was perceived as more trustworthy. AHCP questionnaire is included in Appendix.

Recalled Advice Questionnaire (RAQ)

Another questionnaire developed for this study measured recalled advice of participants. The questionnaire was administered right after participants saw video and asked question directly related to the video.

The questions were developed based on the script HCPs read to patients. Questionnaire was administered in form of open-ended questions which did not give participants any cues to recall information (i.e., weight units, type of information) in order to test recalled advice only. For example, if HCP told patient about BMI norm for normal weight, the questionnaire asked 'Please indicate what body-mass index (BMI) roughly defines healthy weight according to the video?'

Additionally, questionnaire also asked some general questions of qualitative character, for example 'Can you please describe the place where Dr John Smith was standing?'. These

questions were not analysed or coded, however it was assumed that they may provide some additional information about what was participant thinking about the study.

The answers were manually coded after data were collected. Coding system was based on whether participants recalled or not recalled particular information. Therefore, participants were rated on how much information they have remembered. The coding was simple, i.e., zero for not recalling, one for recalling. Recalled information were then summed which meant participant could achieve an overall score from zero to sixteen.

3.5. Procedure

With invitation to research, participants received a link to Qualtrics study. The first page of the study included all information that were necessary for participant to make an informed decision about participating. The informed consent itself was on the next page.

However, participants were invited to study which was called 'Relationship between healthcare providers and their patients', therefore, participants were not told about the true nature of the study and were blinded to the experimental manipulation. This procedure has been approved by Sheffield Hallam University's Faculty of Health and Wellbeing Ethics Committee before data collection started.

After providing informed consent, participants were randomly assigned into eight experimental conditions. The graph below shows the structure of the experiment.
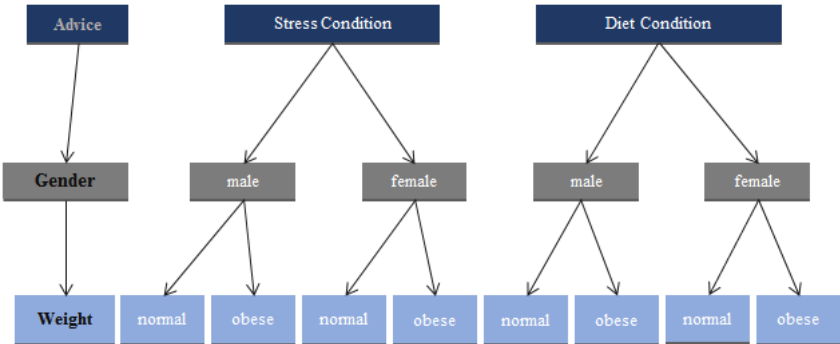
Conditions were different in the *type of advice* (Stress condition or Weight condition), *gender of doctor* and *weight of doctor* (obese or normal weight) as depicted in above. Each condition had two levels, i.e., 2 x 2 x 2 = 8 different conditions.

The assignment to condition was random and each participant had equal chance to be assigned into a condition. Qualtrics simulation of 1600 participants was used to assess a random assignment prior to collecting data.

The video played automatically and participants could not interact with the video, e.g., stopping video, loading it in external page. Before viewing the video, they were also asked to close other tabs in their viewer.

After they have finished watching the video, they were automatically moved to next page with questionnaires. First questionnaire was RAQ which was always slightly modified depending on a particular condition (i.e., names and genders of doctor in questionnaire varied). After RAQ, participants answered AHCP, ATOP, BAOP, F-Scale, and finally a sociodemographic page which collected data on participant's background.

Most questions required an answer, however some questions in sociodemographic data were voluntary (e.g., income question).

After finishing the sociodemographic page, participants were moved to debrief page with a debrief document describing the study in full detail (Appendix).

Procedure of analysis

All data were analysed in Statistical Package for the Social Sciences (i.e., SPSS) v 23 and additionally in R 3.3.1. Power estimations were done prior to data collection in G*Power 3.1.

Main analyses were conducted by applying Multivariate Analysis of Covariance (MANCOVA). The method has benefit of being able to test simultaneously multiple continuous dependent variables while at the same time it can control for multiple covariates across two or more fixed effects, i.e., independent categorical variables (Tabachnick & Fidell, 2012). While dependent variables should be continuous, it is a common procedure to use ordinal variables as dependent variables in social sciences (Garson, 2012).

Depended variables were the Attitudes Towards HCP scales (i.e., measuring on seven subscales; general advice adherence, credibility, trustworthiness, likelihood of selection, compassion, impression, and accepted health behaviour of HCP). Additionally, another depended variable was the sum of scores from the Recalled Advice Questionnaire which measured how much information each participant remembered.

The fixed effect of the model was a categorical variable of Condition (i.e., which conditions were participants assigned to). The covariates included in design were BMI, Age, Gender

(dummy coded), F-Scale, ATOP, and BAOP. These were used as variables that are controlled for.

The goal of main analysis was to determine which variables to focus at depending on their significance. After the main analysis, there are several option as to what follow-up analysis strategy should be employed. Advantages and disadvantages of each option are discussed here.

The first option is run Post - Hoc Comparisons through the SPSS dialog windows, then view the Between - Subject Table, assess the significance and follow-up with pairwise comparison with Bonferroni adjustment and interpret. The negative side of it is that this approach does not assume intercorrelations among dependent variables anymore while MANCOVA does, i.e., correlation between e.g., Compassion and Selection. For inability to control covariates in the follow-up procedure, this method is usually not recommended (e.g., Field, 2013).

The second option is to use Roy-Bargmann Stepdown Procedure as a follow-up (e.g., Tabachnick & Fidell, 2012). This is possible within SPSS syntax and it allows to assess how much is a particular DV responsible for an effect in another DV. Due to its advantage to assess intercorrelations between DVs it is a better procedure. However, the procedure requires the user to select one DV as the primary, i.e., Compassion then Selection *while* controlled for Compassion. This might be an option in different study, however, no particular DV is prioritized in the current study.

Finally, to follow up, it is possible to use several ANCOVAs and linear regressions. After main analysis of MANCOVA, each significant dependent variable is followed with ANCOVA, and each significant covariate is followed by linear regression. The rest of DVs are placed as covariates in the follow-up analyses, therefore are controlled for. This is a compromise between the first univariate method, and the second step-down method. The benefit is that it does not require to assume that any DV is primary. This will be the follow-up strategy utilized in the current study.

Reducing Type I error for Pairwise comparisons

The goal of the first ANCOVA analyses were to explore potential significant effects, and then with followed-up analyses, explore the effects further. The additional tests should be followed with alpha correction to reduce the likelihood of Type I error (e.g., Armstrong, 2014).

To address family-wise error rate, there are number of options that can be used, the most common is the Bonferroni correction (Tabachnick & Fidell, 2012). However, the Bonferroni

correction is extremely conservative test which contradicts the nature of the study as it significantly reduces test power (i.e., Type II error). After careful consideration, the best alternative for the strategy of this study is to use much more precise Holm-Šídák adjustment (e.g., Abdi, 2010). The procedure is discussed with detail in the paper by Abdi (2010), and the equation to adjust the p-values is available in the article (Equation 8 in Abdi, 2010, p. 6).

The Holm-Šídák equation was converted into appropriate function in R statistical program in order to run the analysis (see below).

```
sidak = function(C, i, p) {
 S = 1 - (1 - p)^(C - i + 1)
 S = round(S, 15)
 return(S)
 }
```

The equation was applied to post-hoc analyses of ANCOVA if Condition was significant.

3.6. Data Analysis

Descriptive Statistics

The first demographics that is plotted here is the histogram of countries from which are the data in the current study. Most of the participants come from English speaking countries (i.e., USA, UK). The third most common country is the Czech Republic.

Country of Participant
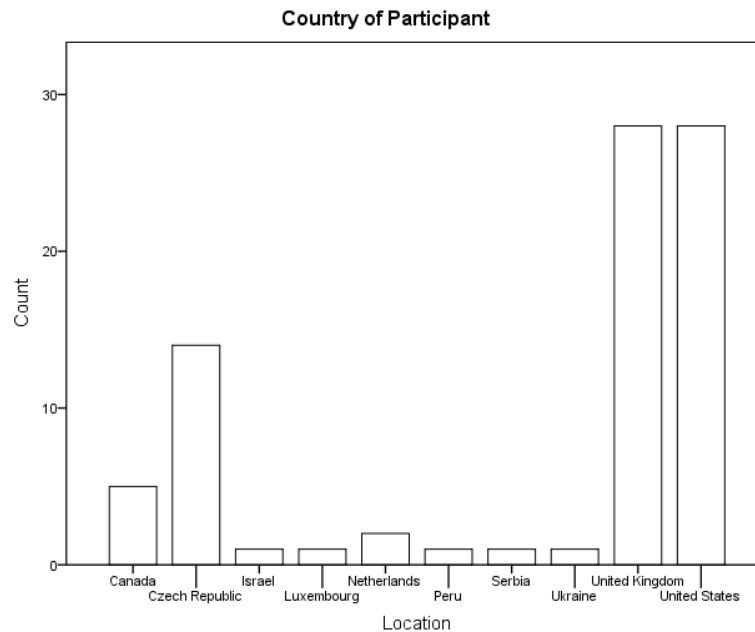
The table below shows basic demographic characteristics of collected sample. Total number of participants was N = 82. The following demographics shows a sample that is on average 30 years old, with 22 more males than females and possibly more overweight or obese (i.e., mean of BMI is 30 kg.m^2).

		Mean	**Count**
Age		30.74	
BMI		30.74	
Gender	Male		52
	Female		30
Smoking	Yes		9
	No		56
Alcohol	Yes		48
	No		17
Activity Level	Low		9

	Medium		34
	High		36
ATOP		59.92	
BAOP		13.98	
FScale		3.95	
Total			82

The variables Age, BMI, and Gender are considered as the most important, therefore follow-up plots are focusing on these variables across all conditions.

The following scatterplot of Age across condition shows that most of conditions had Age relatively equally distributed. On exception was the stress male normal weight condition which had two participants that could be considered as outliers due to their high age. However, the overall trend of data suggests an equal distribution of age across conditions.
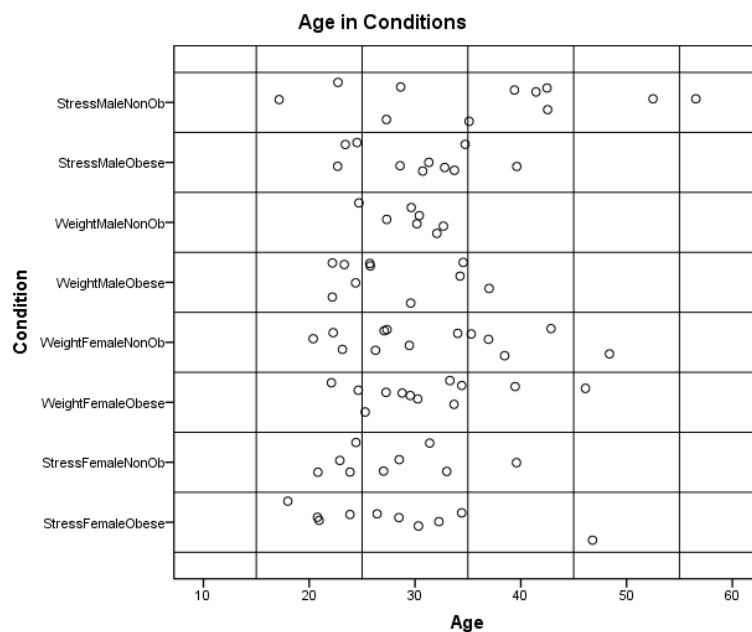
When demographics were broken down into conditions, the disproportion between males and females was even more obvious. Especially condition stress female obese, and weight male normal weight were extreme in terms of their gender membership (i.e., mostly males or mostly females).

Gender in Conditions
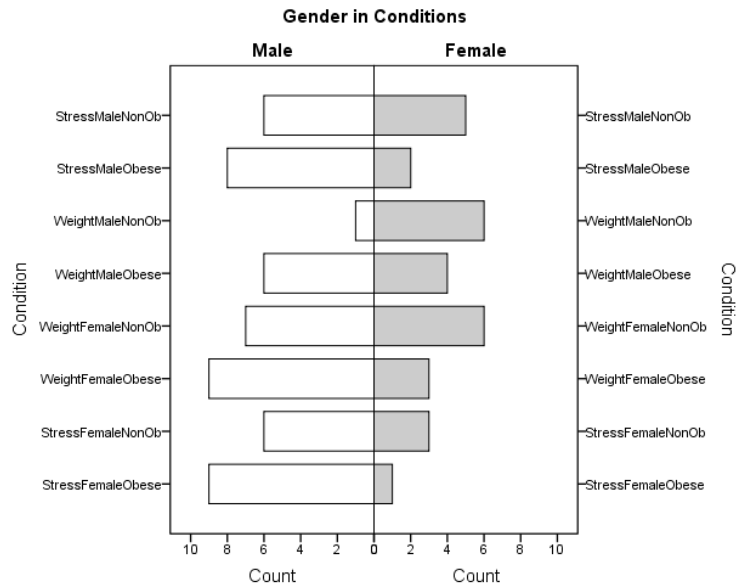
Additionally, the BMI categories were plotted across condition in the following scatterplot. Most of the sample was in normal weight BMI category, however, some conditions, i.e., weight male obese had no one in any other BMI category except for normal weight. This suggest that BMI is likely to be unequally distributed across conditions.

BMI in Conditions
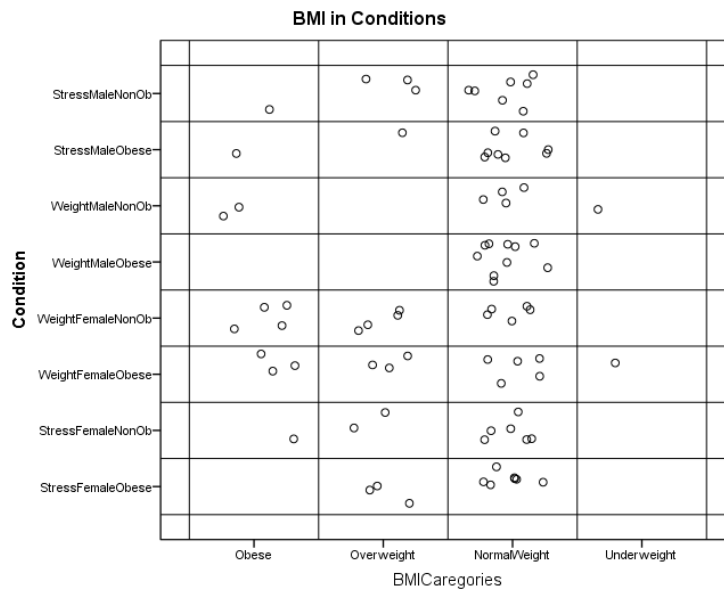
Finally, in order to assess whether any variables were distributed among groups unequally, multinomial logistic regression was used with condition as a dependent variable. Following table shows that regression was significant for ATOP, Gender, and Physical Activity. These results show that the mentioned variables were unequal across groups and findings should take into account this inequality.

Distribution of Variables in Groups

Effect	Chi-Square	df	Sig.
Intercept	7.248	7	.404
Age	4.553	7	.714
Gender	24.626	7	.001
BMI	9.690	7	.207
Smoking	12.338	7	.090
ATOP	37.755	7	.000
Alcohol	4.752	7	.690
Income	9.775	7	.202
METtotal	23.940	7	.001
BAOP	11.543	7	.117
FScale	8.343	7	.303

3.7. Results

3.7.1. Main test – MANCOVA

One-Way Multivariate Analysis of Covariance was used to test an assumption whether *means of all scales on each condition are equal* whilst controlling for additional covariates (i.e., BMI, Age, Gender, F-Scale, ATOP, BAOP). This is important in order to further break down the significant main effects.

Main Analysis - MANCOVA of Covariates and Dependent Variables[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.496	7.492	8.000	61.000	.000	.496
	Wilks' Lambda	.504	7.492	8.000	61.000	.000	.496
Age	Pillai's Trace	.219	2.140	8.000	61.000	.045	.219
	Wilks' Lambda	.781	2.140	8.000	61.000	.045	.219
Gender	Pillai's Trace	.110	.945	8.000	61.000	.487	.110
	Wilks' Lambda	.890	.945	8.000	61.000	.487	.110
BMI	Pillai's Trace	.355	4.202	8.000	61.000	.000	.355
	Wilks' Lambda	.645	4.202	8.000	61.000	.000	.355
ATOP	Pillai's Trace	.158	1.433	8.000	61.000	.201	.158
	Wilks' Lambda	.842	1.433	8.000	61.000	.201	.158
BAOP	Pillai's Trace	.161	1.468	8.000	61.000	.188	.161
	Wilks' Lambda	.839	1.468	8.000	61.000	.188	.161
FScale	Pillai's Trace	.258	2.652	8.000	61.000	.015	.258
	Wilks' Lambda	.742	2.652	8.000	61.000	.015	.258
Condition	Pillai's Trace	1.404	2.101	56.000	469.000	.000	.201
	Wilks' Lambda	.169	2.336	56.000	333.806	.000	.225

a. Design: Intercept + Age + Gender + BMI + ATOP + BAOP + FScale + Condition

The table above shows significance of Wilk's Lambda test for covariates BMI (p = 0.000469, $\eta_p^2 = 0.355313$), Age (p = 0.045273, $\eta_p^2 = 0.219115$), F-Scale (p = 0.014510, $\eta_p^2 = 0.258024$),

and the main effect of Condition (p = 0.000002, η_p^2 = .225). The assumption that 'Means of all scales on each condition are equal', is rejected at p <.01.

At this stage, it is clear that the experimental manipulation was successful because some of the scales had significantly different scores depending on condition. Furthermore, certain sociodemographic characteristics of participants play an important role (i.e., BMI, Age, and their level of fat phobia as measured by the F-Scale) for the overall scores of AHCP scales.

To follow-up these results, ANCOVAs for DV (i.e., AHCP, RAQ) and for Covariates (i.e., BMI, Age, F-Scale) are used (all analysis are available through GLM Univariate option). The methods are in line with assumptions (3.8.) that were used to assess appropriateness of MANCOVA.

As the section with Linearity (3.8.) discussed, the RAQ will be assessed separately from AHCP because these two scales measure a different construct.

Finally, the alpha adjustments will be the last step, i.e., the significant pairwise findings in ANCOVA will be adjusted via Holmz – Šidák method.

Side tests – Follow-up analyses with Linear regressions and ANCOVAs

F-Scale

In order to assess understand the role weight stigmatization results from ATOP, BAOP and F-Scale need to be interpreted. However, as the multivariate test revealed, only the F-Scale was significant, therefore the ANCOVA will be applied to F-Scale as a dependent variable, while controlling for the rest of variables.

Fat Phobia association to other variables

Dependent Variable: FScale

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	11.506[a]	19	.606	4.466	.000	.578
Intercept	8.796	1	8.796	64.862	.000	.511
BAOP	.671	1	.671	4.952	.030	.074
ATOP	1.841	1	1.841	13.575	.000	.180
Age	.652	1	.652	4.811	.032	.072
BMI	.429	1	.429	3.160	.080	.049
Gender	.029	1	.029	.211	.648	.003
AHCP_CRE	1.704	1	1.704	12.568	.001	.169
AHCP_TRU	.002	1	.002	.017	.896	.000
AHCP_SEL	1.365	1	1.365	10.069	.002	.140
AHCP_COMP	.007	1	.007	.051	.823	.001
AHCP_IMPR	.023	1	.023	.172	.680	.003
AHCP_BEH	.278	1	.278	2.052	.157	.032
AHCP_GEN	.100	1	.100	.738	.394	.012
Condition	.821	7	.117	.865	.539	.089
Error	8.408	62	.136			
Total	1302.367	82				
Corrected Total	19.913	81				

a. R Squared = .578 (Adjusted R Squared = .448)

The table of Between-Subject Effects table provides an evidence that the F-Scale was significantly associated with scores in BAOP (p = .029712, η_p^2 = .073959) and ATOP (p = .000483, η_p^2 = .179625), with Age (p = .032036, η_p^2 = .072010), AHCP Credibility (p = .000753, η_p^2 = .168543), and AHCP Selection (p = .002347, η_p^2 = .139709) while controlling for the rest of the variables.

Predicting Fat - Phobia

Dependent Variable: FScale

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound	Partial Eta Squared
Intercept	4.761	.649	7.331	.000	3.463	6.059	.464
BAOP	-.016	.007	-2.225	.030	-.031	-.002	.074
ATOP	-.013	.003	-3.684	.000	-.020	-.006	.180
Age	.014	.006	2.193	.032	.001	.027	.072
AHCP_CRE	-.089	.025	-3.545	.001	-.139	-.039	.169
AHCP_SEL	.079	.025	3.173	.002	.029	.129	.140
Weight Female Non-Obese	.377	.176	2.141	.036	.025	.729	.069
Stress Male Non-Obese	.378	.185	2.050	.045	.009	.747	.063

The parameter estimates provided an additional explanation of this effect. Significant parameter estimates were found for BAOP (p = .029712, η_p^2 = .073959, B = -0.016112), ATOP (p = .000483, η_p^2 = .179625, B = -0.012732), Age (p = .032036, η_p^2 = .072010, B = 0.014066), AHCP Credibility (p = .000753, η_p^2 = .168543, B = -0.088709), AHCP Selection (p = .002347, η_p^2 = .139709, B = 0.079397), Weight Female normal weight Condition (p = .036192, η_p^2 =

.068859, B = 0.376797), and Stress Male Obese Condition (p = .044578, η_p^2 = .063492, B = 0.378269) while controlling for the rest of variables.

The last two variables (i.e., condition) are an issue with a participant sampling, because if the two conditions had significantly different people with their F-Scale scores, it means that the sampled participants were not equally distributed across conditions. This is due to lower sample size.

The connection with ATOP is interpreted as the more a person associated fatness with negative adjectives, the less positive were their attitudes towards obese people. This is not surprising, and in line with precious research.

Additionally, the more a person associated fatness with negative adjectives, the less they believed that the obesity is controllable. This suggest that people fear of fat is generally predicted by their lower believe in the controllability.

The F-Scale was also predicted by the age (i.e., younger people had more fat phobia).

More interesting and important for the hypothesis are results relevant to the two scales that were significant. Higher fat phobia was predicted by lower credibility and at the same time by higher likelihood of choosing HCPs. This is interesting finding as it suggests that the more people fear of fat, the more sceptical of advice they were, but more likely they were to select HCPs.

More interesting and important for the hypothesis are results relevant to the two scales that were significant. Stronger association of fatness with negative adjectives was predicted by lower credibility, and at the same time by higher likelihood of choosing HCPs. This is interesting finding as it suggests that the more a person associated fatness with negative adjectives, the more sceptical of HCP's advice they were, but more likely they were to select HCPs. This might be suggesting an ambivalence in their decision making process.

The results of F-Scale are not enough to provide support on its own to any hypothesis. This means that it is necessary to further look at how the participants performed at conditions, given their scores on credibility and likelihood to selects scales. If their scores were significantly different at certain conditions, it has to be connected with findings about the F-Scale.
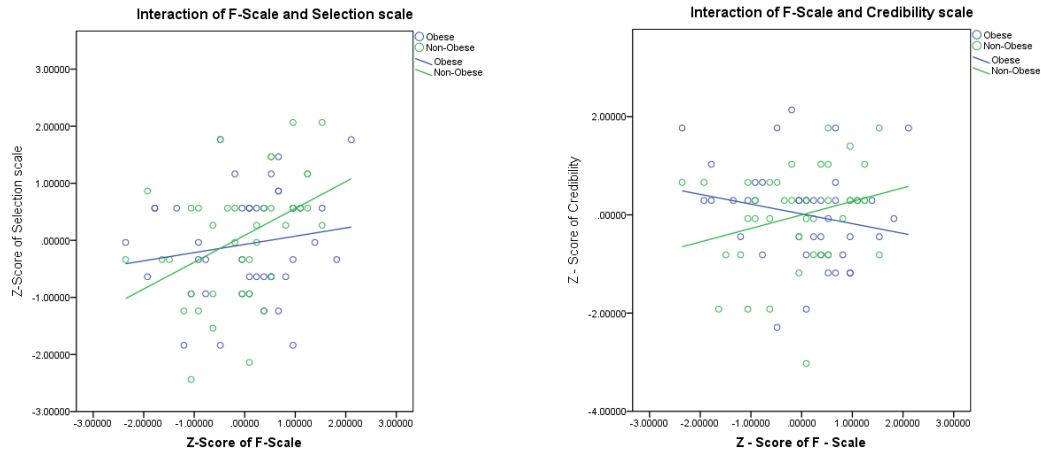
One option how to visualize the significant effect from regression analysis and provide an additional information is to provide a regression estimates of F-Scale interaction with Credibility and Selection scales. The interaction is plotted on BMI level of HCPs, while not taking into account the other conditions (i.e., information and gender). This shows that fat phobia is positively associated with normal weight HCP's likelihood of being selected, and their credibility. The effect for obese HCP is negative for credibility, however the selection is simply a reduced effect of normal weight HCP. This plot is only illustration of what might happen inside, because the F-Scale was *not* significant with condition, therefore the data on F-Scale do not provide a direct support to any hypothesis.
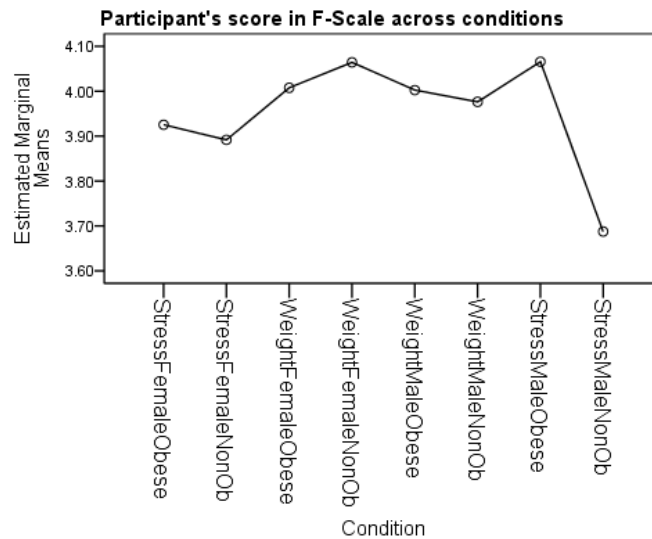
AHCP – General advice adherence

The test of AHCP scale analysed whether there is a significantly different likelihood of following the HCPs advice across conditions while controlling for BMI, Age, Gender, BAOP, ATOP, F-Scale and the rest of DVs (i.e., excluding RAQ scale).

Tests of Between – Subject table (see below) resulted significant only for the covariate of BMI at $p = 0.000069$, and $\eta_p^2 = 0.226904$. Because the only significant factor influencing the general advice adherence was BMI, only parameter estimates table is consulted to break down the results.

General Advice Adherence

Dependent Variable: AHCP_GEN

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	133.597[a]	19	7.031	2.536	.003	.437
Intercept	46.705	1	46.705	16.847	.000	.214
BAOP	5.555	1	5.555	2.004	.162	.031
ATOP	6.650	1	6.650	2.399	.127	.037
FScale	2.045	1	2.045	.738	.394	.012
Age	1.020	1	1.020	.368	.546	.006
BMI	50.447	1	50.447	18.197	.000	.227
Gender	2.670	1	2.670	.963	.330	.015
AHCP_CRE	1.720	1	1.720	.620	.434	.010
AHCP_TRU	4.409	1	4.409	1.591	.212	.025
AHCP_SEL	.314	1	.314	.113	.738	.002
AHCP_COMP	4.060	1	4.060	1.465	.231	.023
AHCP_IMPR	3.427	1	3.427	1.236	.270	.020
AHCP_BEH	.187	1	.187	.067	.796	.001
Condition	26.520	7	3.789	1.367	.235	.134
Error	171.879	62	2.772			
Total	16857.000	82				
Corrected Total	305.476	81				

a. R Squared = .437 (Adjusted R Squared = .265)

The results of Parameter estimate (only significant effect is interpreted, e.g., BMI) provide evidence for the negative relationship between BMI and General Advice Adherence at p = 0.000069, *B = -0.150062,* and η_p^2 = 0.226904. This suggest that as BMI of participant was higher, the lower the likelihood of following the advice.

While this is not possible to interpret by a condition (i.e., non-significant), the profile plot after the table suggests that this was possibly most relevant to people within male condition. Thus, lower BMI leads to a higher score in General Advice Adherence across Male Conditions, while reverse was true for Female Conditions.

Association between BMI and Advice Adherence

Dependent Variable: AHCP_GEN

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	14.966	3.533	4.236	.000	7.903	22.029	.224
BMI	-.150	.035	-4.266	.000	-.220	-.080	.227

Scores on General Advice Adherence Scale Across Condtions
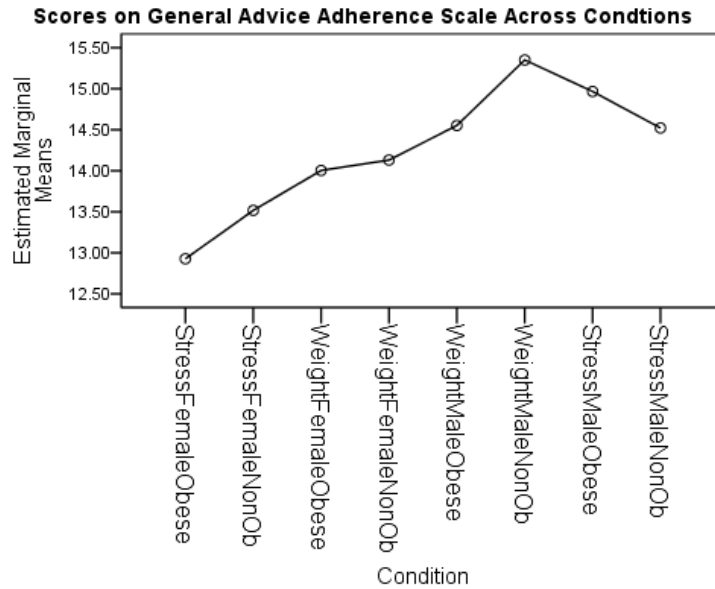
The evidence from the General Advice Adherence scale provides information relating to BMI, i.e., lower BMI, better score on scale. However, it does not provide an evidence that the participants would express their following of HCPs advice because of a particular condition, therefore no direct support to any hypothesis.

AHCP – Credibility

The ANCOVA analysed how likely was a person to perceive the HCP as credible, depending on condition they were in while controlling for BMI, Age, Gender, BAOP, ATOP, F-Scale and the rest of DVs (i.e., excluding RAQ scale).

Credibility

Dependent Variable: AHCP_CRE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	415.401[a]	19	21.863	7.528	.000	.698
Intercept	25.335	1	25.335	8.723	.004	.123
BAOP	1.067	1	1.067	.367	.547	.006
ATOP	8.121	1	8.121	2.796	.100	.043
Age	25.037	1	25.037	8.620	.005	.122
BMI	8.665	1	8.665	2.983	.089	.046
Gender	1.075	1	1.075	.370	.545	.006
AHCP_TRU	3.514	1	3.514	1.210	.276	.019
AHCP_SEL	37.798	1	37.798	13.014	.001	.173
AHCP_COMP	2.077	1	2.077	.715	.401	.011
AHCP_IMPR	5.167	1	5.167	1.779	.187	.028
AHCP_BEH	1.831	1	1.831	.630	.430	.010
AHCP_GEN	1.802	1	1.802	.620	.434	.010
FScale	36.503	1	36.503	12.568	.001	.169
Condition	10.781	7	1.540	.530	.808	.056
Error	180.074	62	2.904			
Total	17147.000	82				
Corrected Total	595.476	81				

a. R Squared = .698 (Adjusted R Squared = .605)

The test resulted significant for Age (p = 0.004659, η_p^2 = 0.122063), AHCP Selection (p = 0.000618, η_p^2 = 0.173485), and F-Scale (p = 0.000753, η_p^2 = 0.168543).

The significant predictor variables were Age (p = 0.004659, η_p^2 = 0.122063, B = 0.084751), AHCP_SEL (p = 0.000618, η_p^2 = 0.173485, B = 0.409464), and F-Scale (p = 0.000753, η_p^2 = 0.168543, B = -1.899968).

Association between Credibility, Age, and F-Scale

Dependent Variable: AHCP_CRE

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	10.493	3.884	2.701	.009	2.728	18.258	.105
Age	.085	.029	2.936	.005	.027	.142	.122
AHCP_SEL	.409	.114	3.607	.001	.183	.636	.173
FScale	-1.900	.536	-3.545	.001	-2.971	-.829	.169

The credibility of HCPs was predicted by Age, and F-Scale, i.e., higher Age of participant, predicted more credibility of HCPs and lower fat phobia predicted higher credibility of HCPs. Additionally, higher attributed credibility of HCP was positively predicted by the higher likelihood of selecting the HCPs.

However, the condition was not significant. This means that it is not possible to tell how the participants were influenced by the condition because the significance was due to covariates or other variables.

Additional information provides the profile plot below. The participants evaluated each healthcare professionals with similar credibility, i.e., no significance.

Results do not provide a significant support that credibility is determined by a condition, therefore these data do not provide a direct support for any hypothesis.
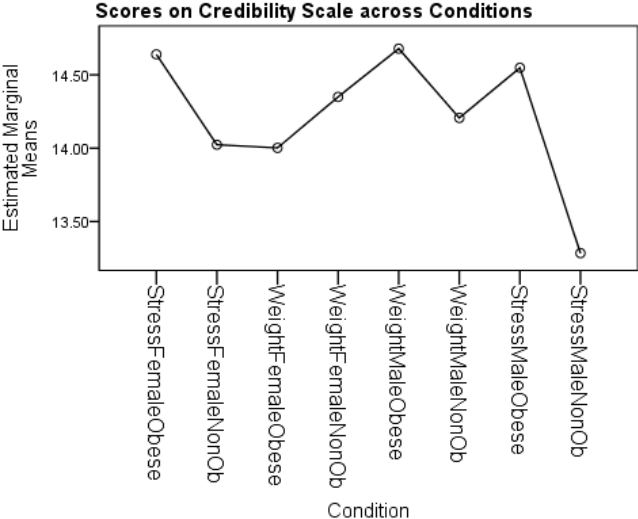
AHCP Trust

The between Subject Effects table provides significant results that the Trust was influenced by the ACHP Selection (p = 0.010321, η_p^2 = 0.101437), AHCP Compassion (p = 0.012211, η_p^2 = 0.097063), and for the first time by the Condition (p = 0.023590, η_p^2 = 0.222014). These results show that trusting healthcare professional was significantly influenced by how compassionate HCPs were, and how likely they were selected, on top of that, the condition was an important to perceived compassion. The parameter estimates will provide further information on top of that.

Trust

Dependent Variable: AHCP_TRU

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	436.565[a]	19	22.977	9.898	.000	.752
Intercept	.006	1	.006	.003	.958	.000
BAOP	.296	1	.296	.128	.722	.002
ATOP	.203	1	.203	.087	.769	.001
Age	6.076	1	6.076	2.617	.111	.041
BMI	.000	1	.000	.000	.989	.000
Gender	2.810	1	2.810	1.211	.275	.019
AHCP_SEL	16.247	1	16.247	6.999	.010	.101
AHCP_COMP	15.471	1	15.471	6.665	.012	.097
AHCP_IMPR	.899	1	.899	.387	.536	.006
AHCP_BEH	.188	1	.188	.081	.777	.001
AHCP_GEN	3.692	1	3.692	1.591	.212	.025
FScale	.040	1	.040	.017	.896	.000
AHCP_CRE	2.808	1	2.808	1.210	.276	.019
Condition	41.071	7	5.867	2.528	.024	.222
Error	143.923	62	2.321			
Total	17792.000	82				
Corrected Total	580.488	81				

a. R Squared = .752 (Adjusted R Squared = .676)

The table of trust predictors shows that the likelihood of selecting HCPs (B = 0.279912) was predicting positively their Trustworthiness, and the same effect was found for Compassion (B = 0.287679). That is, the more likely person was to select a HCPs, and the more likely was a person to perceive HCP as compassionate, the more trust they had in the HCP.

Association between Trust and Selection, Compassion, Condition

Dependent Variable: AHCP_TRU

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound	Partial Eta Squared
Intercept	-1.229	3.668	-.335	.739	-8.561	6.104	.002
AHCP_SEL	.280	.106	2.646	.010	.068	.491	.101
AHCP_COMP	.288	.111	2.582	.012	.065	.510	.097
Stress Female Obese	1.923	.830	2.318	.024	.265	3.582	.080
Weight Female Obese	1.985	.849	2.338	.023	.288	3.683	.081
Weight Female NonObese	2.245	.699	3.214	.002	.849	3.642	.143
Weight Male Obese	2.053	.791	2.595	.012	.472	3.635	.098
Stress Male Obese	1.716	.758	2.264	.027	.201	3.231	.076

The conditions that were predicting the Trust of HCPs were Stress Female Obese (p = 0.023778, B = 1.923136, η_p^2 = 0.079736), Weight Female Obese (p = 0.022621, B = 1.985458, η_p^2 = 0.081031), Weight Female normal weight (p = 0.002078, B = 2.245236, η_p^2 = 0.142826), Weight Male Obese (p = 0.011785, B = 2.053410, η_p^2 = 0.097987) and Stress Male Obese (p = 0.027115, B = 1.716002, η_p^2 = 0.076329). The situation is illustrated in the following profile plot.
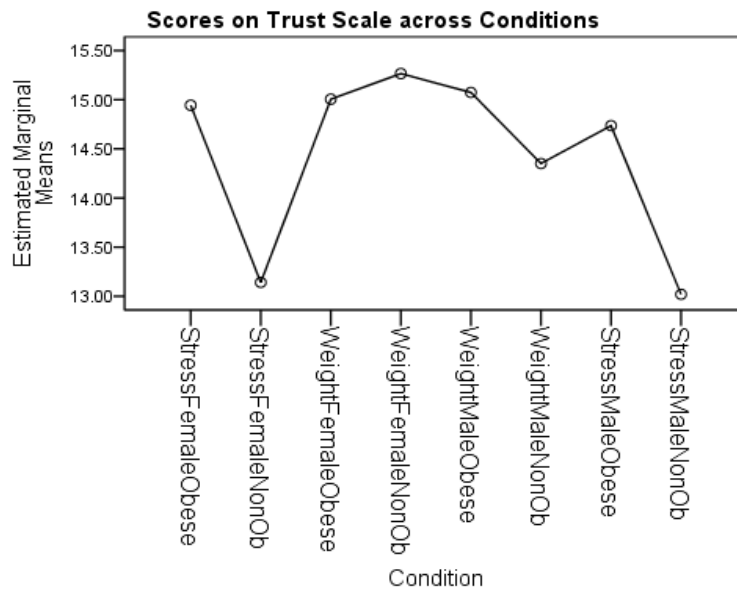
The plot provides a visual information that trust was significantly influenced in a positive direction by seeing video of Stress Female Obese, Weight Female Obese, Weight Female normal weight, Weight Male Obese and Stress Male Obese. For further interpretation, the inspection of Pairwise comparisons is necessary where the conditions are compared next to each other.

When there was no adjustment for Type I error, there were several significant comparisons. The Šidák – Holm adjustment reduced the Type I error, resulting in significant results for the following comparisons (see section 3.5.).

Comparison of Trust between Conditions

Dependent Variable: AHCP_TRU

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
StressFemaleNonOb	WeightFemaleNonOb	-2.124	.714	.033	-3.551	-.697
WeightFemaleNonOb	StressFemaleNonOb	2.124	.714	.029	.697	3.551
	StressMaleNonOb	2.245	.699	.017	.849	3.642
StressMaleNonOb	WeightFemaleNonOb	-2.245	.699	.017	-3.642	-.849

Based on estimated marginal means

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The table provides an information that Weight Female normal weight condition was significantly different from Stress Female normal weight (p = 0.028889), and Stress Male normal weight (p = 0.016504), similarly if reversed. That means that Weight Female Non Obese Condition was on average assessed with more trust than Stress Female Obese and Stress Male Non Obese. This result can be plausibly interpreted so that Weight Condition Non-Obesity elicited more trust than the Stress Condition Non-Obesity.

Results do not provide a significant support that trust is determined by a condition, therefore these data do not provide a direct support for any hypothesis.

AHCP Selection

The following table show results of AHCP Selection, i.e., how likely was healthcare professional selected.

Selection

Dependent Variable: AHCP_SEL

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	712.450[a]	19	37.497	12.477	.000	.793
Intercept	21.143	1	21.143	7.035	.010	.102
BAOP	6.869	1	6.869	2.286	.136	.036
ATOP	.429	1	.429	.143	.707	.002
Age	10.713	1	10.713	3.565	.064	.054
BMI	8.165	1	8.165	2.717	.104	.042
Gender	.010	1	.010	.003	.955	.000
FScale	30.260	1	30.260	10.069	.002	.140
AHCP_GEN	.340	1	.340	.113	.738	.002
AHCP_CRE	39.111	1	39.111	13.014	.001	.173
AHCP_TRU	21.034	1	21.034	6.999	.010	.101
AHCP_COMP	13.860	1	13.860	4.612	.036	.069
AHCP_IMPR	1.316	1	1.316	.438	.511	.007
AHCP_BEH	.787	1	.787	.262	.611	.004
Condition	29.689	7	4.241	1.411	.217	.137
Error	186.330	62	3.005			
Total	15018.000	82				
Corrected Total	898.780	81				

a. R Squared = .793 (Adjusted R Squared = .729)

The Selection of participant was significantly influenced by their Credibility (p = 0.000618, η_p^2 = 0.173485), Trustworthiness (p = 0.010321, η_p^2 = 0.101437), Compassion (p = 0.035671, η_p^2 = 0.069233), and F-Scale (p = 0.002347, η_p^2 = 0.139709) while controlling for the rest of DVs and demographic characteristics.

These results provide an evidence that decision, whether AHCPs is followed is influenced by their Credibility, Trustworthiness, Compassion and how the score of fat – phobia scale, to assess the direction of the association, Parameter estimates are viewed (see below).

Association between Selection and Credibility, Trust, Compassion, FScale, Condtion

Dependent Variable: AHCP_SEL

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval Lower Bound	Upper Bound	Partial Eta Squared
Intercept	-9.410	4.003	-2.351	.022	-17.412	-1.409	.082
FScale	1.760	.555	3.173	.002	.651	2.868	.140
AHCP_CRE	.424	.117	3.607	.001	.189	.658	.173
AHCP_TRU	.362	.137	2.646	.010	.089	.636	.101
AHCP_COMP	.276	.129	2.147	.036	.019	.534	.069
Weight Female Obese	-2.461	.958	-2.568	.013	-4.376	-.545	.096

Additional significant predictor was found for condition (i.e., Weight Female Obese), however, given non-significance of condition, the results are not further interpreted.

In lines with findings from above, the F-Scale (B = 1.759617) positively predicted the selection of HCPs. The Trust (B = 0.362388), Compassion (B = 0.276448), and Credibility (B = 0.423689) all predicted positively the likelihood of selecting a particular HCPs, in other words,

more trustworthy, compassionate and credible the HCPs is, the more likelihood of their selection. This is a logical conclusion.

Despite this conclusion, results do not provide a significant support that the likelihood of being selected is determined by a condition, therefore these data do not provide a direct support for any hypothesis.

Scores on Selection Scale across Conditions

AHCP Compassion

The differences were found for AHCP Trust (p = 0.012211, η_p^2 = 0.097063), Selection (p = 0.035671, η_p^2 = 0.069233) and Condition (p = 0.006166, η_p^2 = 0.263944).

Compassion

Dependent Variable: AHCP_COMP

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	516.921[a]	19	27.206	9.993	.000	.754
Intercept	2.087	1	2.087	.767	.385	.012
ATOP	.777	1	.777	.286	.595	.005
BAOP	2.304	1	2.304	.846	.361	.013
FScale	.138	1	.138	.051	.823	.001
AHCP_GEN	3.988	1	3.988	1.465	.231	.023
AHCP_CRE	1.947	1	1.947	.715	.401	.011
AHCP_TRU	18.145	1	18.145	6.665	.012	.097
AHCP_SEL	12.556	1	12.556	4.612	.036	.069
AHCP_IMPR	6.988	1	6.988	2.567	.114	.040
AHCP_BEH	.013	1	.013	.005	.946	.000
Age	1.539	1	1.539	.565	.455	.009
Gender	5.361	1	5.361	1.969	.166	.031
BMI	.564	1	.564	.207	.651	.003
Condition	60.530	7	8.647	3.176	.006	.264
Error	168.798	62	2.723			
Total	18159.000	82				
Corrected Total	685.720	81				

a. R Squared = .754 (Adjusted R Squared = .678)

In order to interpret the results, Parameter estimates and Pairwise comparison with alpha adjustment are reviewed.

Association between Compassion and Trust, Selection, Condition

Dependent Variable: AHCP_COMP

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	3.125	3.956	.790	.433	-4.783	11.033	.010
AHCP_TRU	.337	.131	2.582	.012	.076	.599	.097
AHCP_SEL	.250	.117	2.147	.036	.017	.484	.069
Weight Female Obese	2.554	.903	2.829	.006	.750	4.359	.114

The results of Parameter estimates show that Compassion is positively predicted by Trust (B = 0.337401) and Selection (B = 0.250437), (i.e., in line with previous findings). This means that higher Trust and Selection is predicting higher Compassion.

Additionally, Condition of Stress Female Obese (p = 0.006278, B = 2.554233, η_p^2 = 0.114344) is a positive predictor of the Compassion scale, this suggests that participants in that condition had significant association between being in a particular condition and giving higher scores.

Finally, in order to look further into the Condition effect, pairwise comparisons with adjusted alpha are inspected. Given the significant effect of Condition, multiple pairs were also significant, however they need to be adjusted for Type I error prior to interpretation.

Comparison of Compassion between Condition

Dependent Variable: AHCP_COMP

| (I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
WeightFemaleObese	WeightFemaleNonOb	2.965	.764	.002	1.438	4.492
	WeightMaleObese	2.699	.738	.004	1.225	4.174
	WeightMaleNonOb	2.957	.933	.012	1.092	4.823
	StressMaleObese	2.507	.779	.012	.950	4.064
	StressMaleNonOb	2.554	.903	.025	.750	4.359
WeightFemaleNonOb	WeightFemaleObese	-2.965	.764	.002	-4.492	-1.438
WeightMaleObese	WeightFemaleObese	-2.699	.738	.004	-4.174	-1.225
WeightMaleNonOb	WeightFemaleObese	-2.957	.933	.019	-4.823	-1.092
StressMaleObese	WeightFemaleObese	-2.507	.779	.016	-4.064	-.950
StressMaleNonOb	WeightFemaleObese	-2.554	.903	.049	-4.359	-.750

Based on estimated marginal means

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

After the adjustment, the significant pair were between **Weight Female Obese** and Weight Female normal weight (p = 0.002030), Weight Male Obese (p = 0.003662), Weight Male normal weight (p = 0.011824), Stress Male Obese (p = 0.012255), and Stress Male normal weight (p = 0.024877). The same holds the other way around.

The following results provide an evidence that in terms of compassion, obese female healthcare professional was perceived rather positively, i.e., such as participants perceived that this HCP would understand their concerns and seemed caring.

This results seems to contradict the assumptions of Hypothesis 1; 'The HCP with obesity will elicit significantly more weight stigma than normal weight HCP.'

Profile plot

Scores on Compassion Scale across Conditions
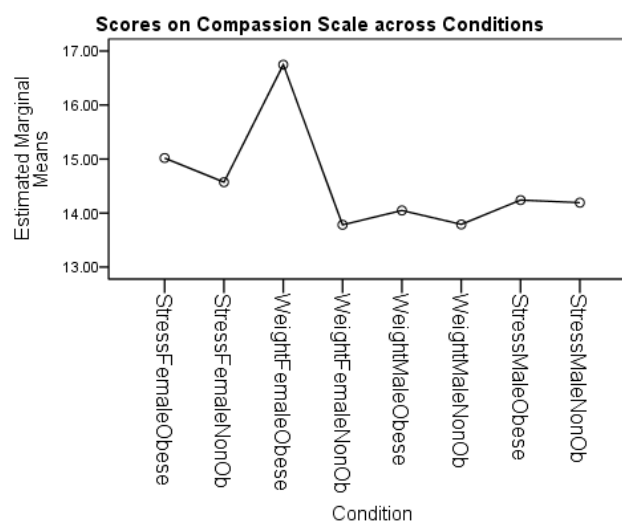
AHCP Impression

The Between Subject effect were found for BMI (p = 0.018183, η_p^2 = 0.086707), and Condition (p = 0.000472, η_p^2 = 0.333862).

Impression

Dependent Variable: AHCP_IMPR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	336.493[a]	19	17.710	5.854	.000	.642
Intercept	.476	1	.476	.157	.693	.003
BAOP	2.733	1	2.733	.903	.346	.014
ATOP	1.897	1	1.897	.627	.431	.010
Age	1.527	1	1.527	.505	.480	.008
BMI	17.807	1	17.807	5.886	.018	.087
Gender	2.644	1	2.644	.874	.353	.014
FScale	.521	1	.521	.172	.680	.003
AHCP_GEN	3.740	1	3.740	1.236	.270	.020
AHCP_CRE	5.382	1	5.382	1.779	.187	.028
AHCP_TRU	1.172	1	1.172	.387	.536	.006
AHCP_BEH	4.801	1	4.801	1.587	.213	.025
AHCP_SEL	1.324	1	1.324	.438	.511	.007
AHCP_COMP	7.765	1	7.765	2.567	.114	.040
Condition	94.007	7	13.430	4.439	.000	.334
Error	187.568	62	3.025			
Total	17591.000	82				
Corrected Total	524.061	81				

a. R Squared = .642 (Adjusted R Squared = .532)

Assessing the parameters resulted in significant BMI (B = 0.097), and two conditions Weight Female Obese (p = 0.000199, B = -3.574566, η_p^2 = 0.201535), and Weight Male Obese (p = 0.000716, B = -3.086114, η_p^2 = 0.169829) which both predicted negatively the Impression score.

Possible interpretation might be that as for BMI, the heavier participants were, the better impression they've had about healthcare professional. Additionally, the Obesity of HCP across all Weight conditions predicted a lower level of Impression, i.e. worse impression such as that the HCP seemed sloppy, unintelligent, and lazy if person was viewing video of Weight Consultation. This gives a space to possible interpretation that participants perceived negatively if an obese HCPs provided a medical advice about weight.

Association between Impression and BMI, Condition

Dependent Variable: AHCP_IMPR

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval Lower Bound	Upper Bound	Partial Eta Squared
Intercept	-.128	4.191	-.030	.976	-8.506	8.250	.000
BMI	.097	.040	2.426	.018	.017	.177	.087
Weight Female Obese	-3.575	.904	-3.956	.000	-5.381	-1.768	.202
Weight Male Obese	-3.086	.867	-3.561	.001	-4.818	-1.354	.170

Finally, the pairwise comparison resulted significant for several comparisons after the alpha adjustments. Namely, Weight Female Obese against the Stress Female Non Obese (p = 0.002266), Weight Female normal weight (p = 0.003523), and Stress Male normal weight (p = 0.001591). Additionally, between Weight Male Obese and Stress Female normal weight (p = 0.008745), Weight Female normal weight (p = 0.016831), and Stress Male normal weight (p = 0.005714).

Comparison of Impression across Condition
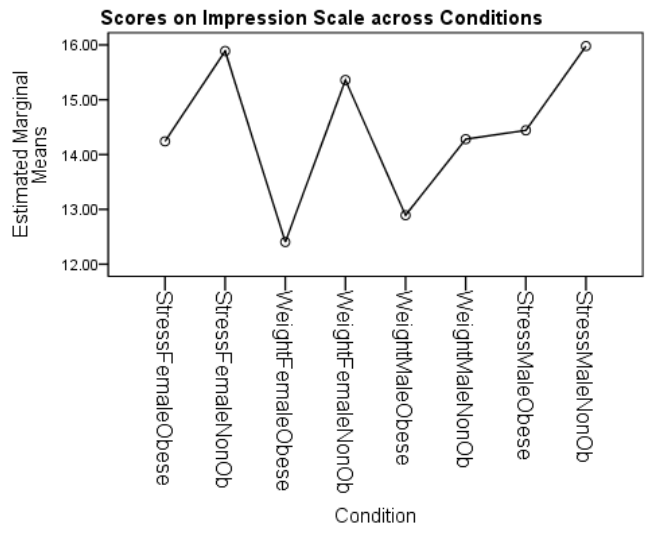
Dependent Variable: AHCP_IMPR

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
StressFemaleNonOb	WeightFemaleObese	3.484	.915	.003	1.655	5.313
	WeightMaleObese	2.996	.886	.009	1.225	4.767
WeightFemaleObese	StressFemaleNonOb	-3.484	.915	.002	-5.313	-1.655
	WeightFemaleNonOb	-2.955	.816	.004	-4.586	-1.325
	StressMaleNonOb	-3.575	.904	.002	-5.381	-1.768
WeightFemaleNonOb	WeightFemaleObese	2.955	.816	.005	1.325	4.586
	WeightMaleObese	2.467	.793	.020	.881	4.052
WeightMaleObese	StressFemaleNonOb	-2.996	.886	.009	-4.767	-1.225
	WeightFemaleNonOb	-2.467	.793	.017	-4.052	-.881
	StressMaleNonOb	-3.086	.867	.006	-4.818	-1.354
StressMaleNonOb	WeightFemaleObese	3.575	.904	.002	1.768	5.381
	WeightMaleObese	3.086	.867	.005	1.354	4.818

Based on estimated marginal means

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

These are important findings for the study. While the other scales were measuring the effect of weight stigma indirectly, this scale was the closest to expressing the weight stigma. The results show that, weight stigmatization occurred towards the HCP, whether they were male or female. The important was that they were obese which by itself predicted the weight stigmatization. Additionally, the score was even lover if they were obese HCP and giving an advice about weight loss. Although males and females had different means scores (i.e., males had a slightly better score), the difference was non-significant.

The profile plot shows this as a visualization.

Scores on Impression Scale across Conditions

AHCP Healthy Behaviour

The Between Subject effect were when comparing AHCP Behaviour were found only for AHCP Trust (p = 0.031665, η_p^2 = 0.072312).

Healthy Behaviour

Dependent Variable: AHCP_BEH

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	263.247[a]	19	13.855	1.951	.025	.374
Intercept	12.854	1	12.854	1.810	.183	.028
BAOP	34.319	1	34.319	4.833	.032	.072
ATOP	4.711	1	4.711	.663	.418	.011
Age	4.626	1	4.626	.651	.423	.010
BMI	1.191	1	1.191	.168	.684	.003
Gender	.161	1	.161	.023	.881	.000
FScale	14.575	1	14.575	2.052	.157	.032
AHCP_GEN	.479	1	.479	.067	.796	.001
AHCP_CRE	4.476	1	4.476	.630	.430	.010
AHCP_TRU	.574	1	.574	.081	.777	.001
AHCP_SEL	1.861	1	1.861	.262	.611	.004
AHCP_COMP	.033	1	.033	.005	.946	.000
AHCP_IMPR	11.268	1	11.268	1.587	.213	.025
Condition	65.035	7	9.291	1.308	.262	.129
Error	440.278	62	7.101			
Total	17085.000	82				
Corrected Total	703.524	81				

a. R Squared = .374 (Adjusted R Squared = .182)

The effect provides an information that while controlling for other DV and sociodemographic characteristic, the only significant effect was found for BAOP (p = 0.031665, η_p^2 = 0.072312).

Association between Healthy Behaviour and BAOP

Dependent Variable: AHCP_BEH

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	9.133	6.316	1.446	.153	-3.492	21.758	.033
BAOP	-.115	.052	-2.198	.032	-.220	-.010	.072

Additionally, parameter estimates showed that the relationship was negative, i.e., BAOP stronger beliefs that obesity is controllable predicted lower score at what is acceptable healthy behaviour of HCP. This is in line with the theoretical assumption that stronger beliefs about obesity controllability are attributing personal blame to people with obesity.

While this provides support in line with current research, these results are not supporting the hypothesis that unhealthy behaviour will be less acceptable in obese HCP condition.

RAQ

Last of the analysis was a measure of Recalled Advice across different conditions while controlling for the rest of the factors. The results of Between – Subject effect table provide no evidence that any of the factors would significantly influence the recalled advice. Null variant of Hypothesis 3 cannot be rejected based on data provided below.

Recalled Advice Questionnaire

Dependent Variable: RAQTotal16n

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	194.137[a]	20	9.707	1.362	.178	.309
Intercept	.206	1	.206	.029	.866	.000
BAOP	3.267	1	3.267	.458	.501	.007
ATOP	.013	1	.013	.002	.966	.000
Age	4.887	1	4.887	.686	.411	.011
BMI	18.593	1	18.593	2.608	.111	.041
Gender	16.276	1	16.276	2.283	.136	.036
FScale	8.544	1	8.544	1.199	.278	.019
AHCP_GEN	4.849	1	4.849	.680	.413	.011
AHCP_CRE	3.171	1	3.171	.445	.507	.007
AHCP_TRU	.418	1	.418	.059	.809	.001
AHCP_SEL	.015	1	.015	.002	.964	.000
AHCP_COMP	23.486	1	23.486	3.295	.074	.051
AHCP_IMPR	15.437	1	15.437	2.166	.146	.034
AHCP_BEH	.012	1	.012	.002	.967	.000
Condition	101.101	7	14.443	2.026	.066	.189
Error	434.839	61	7.129			
Total	6846.000	82				
Corrected Total	628.976	81				

a. R Squared = .309 (Adjusted R Squared = .082)

Although results are not significant, the profile plots for this scale are provided below.

Scores on RAQ Scale across Condition
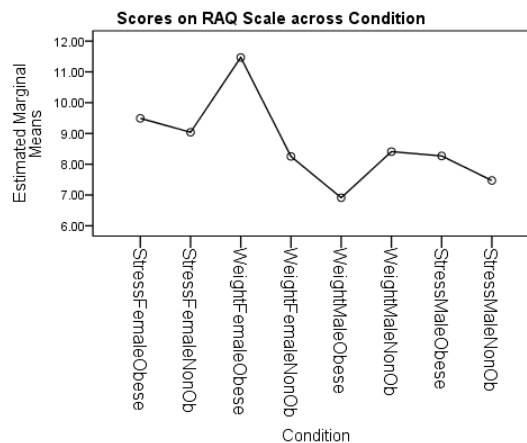
3.8. Assumptions of the Statistical Tests

Outliers

The first assumption that is considered is removal of outliers. Potential outliers in data may affect the results of MANCOVA, therefore they need to be removed or selected out (Tabachnick

& Fidell, 2012). Furthermore, the outlier can affect also results of other assumptions, therefore it has to be the first assumption to assess.

In order to remove potential outliers, the overall scores on all dependent (AHCP, RAQ) and independent scales (F-Scale, BAOP, ATOP) were assessed. Outliers were eliminated by analysing the output of Exploratory Data Analysis in SPSS (i.e., box plots and case processing summary). The participants who were considered as outliers had to be 'extreme' at two or more scales.

The ID 89 and 8 met the condition to be considered outliers, therefore they do not appear in any other analysis. Additionally, ID 8 was a participant who did not answer any item on RAQ scale. Therefore, two participants were excluded from any additional analysis and assumption checks.

Formally, outliers are assessed by computing Mahalanobis Distance Values (Tabachnick & Fidell, 2012). Below are outputs of Outlier Statistics with X^2 (i.e., Chi-Square). Number of dependent variables in the model was eight, therefore df $= (n - 1) = 7$ (i.e., Chi-Square critical values is 24.32;Tabachnick & Fidell, 2012). Table below shows that no multivariate outliers were found as; highest $X^2 = 10.422$ (marked grey).

Outlier Statistics

Stress Female Obese	Stress Female Non-Obese	Weight Female Obese	Weight Female Non-Obese	Weight Male Obese	Weight Male Non-Obese	Stress Male Obese	Stress Male Non-Obese
8.033703	7.111	9.587	10.422	8.099	5.143	8.1	8.888
8.027734	7.111	9.502	10.059	8.046	5.143	8.074	8.355
7.939982	7.111	9.354	9.872	8.04	5.143	8.049	8.211
7.928962	7.111	8.768	9.3	8.04	5.143	8.041	8.182
7.709218	7.111	8.704	9.243	7.895	5.143	8.021	7.835

7.665714	7.111	8.656	8.073	7.567	5.143	7.902	7.299
7.091169	7.111	8.345	6.904	7.464	5.143	6.884	7.288
6.874136	7.111	7.334	6.808	7.437		6.266	6.823
5.987542	7.111	4.831	6.502	5.862		5.989	6.481
4.74184		4.772	6.333	3.549		4.674	6.205

ID variables are not shown as none
was above critical value

Unequal sample size and Missing data

There may have been potential issue were demographics characteristics, i.e., BMI, Age, and Gender which were not sampled into conditions with same probability. The unequal analysis therefore focuses on these sociodemographic characteristics of the participants. Results for each of the scales used in the study are presented below.

| | Age | Gender | | BMI Class | | | | BMI |
	Mean	Male Row N %	Female Row N %	Obese Row N %	Overweight Row N %	NormWeight Row N %	Underweight Row N %	Mean
StressFemaleObese	28	90.0%	10.0%	0.0%	30.0%	70.0%	0.0%	23.89
StressFemaleNonOb	28	66.7%	33.3%	11.1%	22.2%	66.7%	0.0%	23.89
WeightFemaleObese	31	75.0%	25.0%	25.0%	25.0%	41.7%	8.3%	26.37
WeightFemaleNonOb	32	53.8%	46.2%	30.8%	30.8%	38.5%	0.0%	27.94
WeightMaleObese	28	60.0%	40.0%	0.0%	0.0%	100.0%	0.0%	22.55
WeightMaleNonOb	31	14.3%	85.7%	28.6%	0.0%	57.1%	14.3%	26.93
StressMaleObese	30	80.0%	20.0%	10.0%	10.0%	80.0%	0.0%	22.88
StressMaleNonOb	37	54.5%	45.5%	9.1%	27.3%	63.6%	0.0%	24.96

As the table shows, several conditions did not have underweight, overweight, and obese participants. Age seemed to be relatively equal across each condition. These data are consistent with data from demographics about participants.

Skewness and Kurtosis for BMI & AGE

		Age	BMI
N	Valid	82	82
	Missing	0	0
Std. Deviation		7.743	6.15423
Variance		59.949	37.875
Skewness		1.017	2.641
Std. Error of Skewness		.266	.266
Kurtosis		1.033	9.108
Std. Error of Kurtosis		.526	.526

Finally, characteristics of sample show that BMI is peaked and positively skewed (i.e., higher BMI above 2.0 of Skewedness).

Multivariate normality

In order to assess multivariate normality, the SPSS macro developed by DeCarlo (1997) was used. DeCarlo includes measures that test the multivariate normality through kurtosis of dependent variables (DeCarlo, 1997). The macro is free to download and use at DeCarlo's personal page http://www.columbia.edu/~ld208/normtest.sps.

The results include Small's and Srivistava's tests of multivariate kurtosis and skewness, and an omnibus test of multivariate normality based on Small's statistics (Dattalo, 2013). The null hypothesis of these tests is that data equal multivariate normal distribution at $\alpha = .05$ (Dattalo, 2013). The output is provided in the following table.

Multivariate Statistics

Tests of multivariate skew		df	p-value
Small's test	9.3580	8.0000	.3130
Srivastava's test	20.8846	8.0000	**.0075**
Tests of multivariate kurtosis		**df**	
A variant of Small's test	9.4506	8.0000	.3057
Srivastava's test	3.5708	**N(b2p)** = 2.9841	**.0028**
Mardia's test	82.2443	**N(b2p)** = .8033	.4218
Omnibus test of multivariate normality	18.8085	16.0000	.2787

Small's tests, Mardia's test, and Omnibus test of multivariate normality resulted as non-significant. However both Srivastava's test was significant. Tabachnick and Fidell (2012) suggest to transform, delete data, or use additional covariates to reduce error at the costs of lesser statistical power of test.

Linearity and Multicollinearity

Analysing Linearity is suggested visually by a scatterplot for each of the condition (Field, 2013; Tabachnick & Fidell, 2012). Below is provided a scatterplot of dependent variables without controlling the condition.

Scatter plot of Dependent Variables - Visualizing Linearity
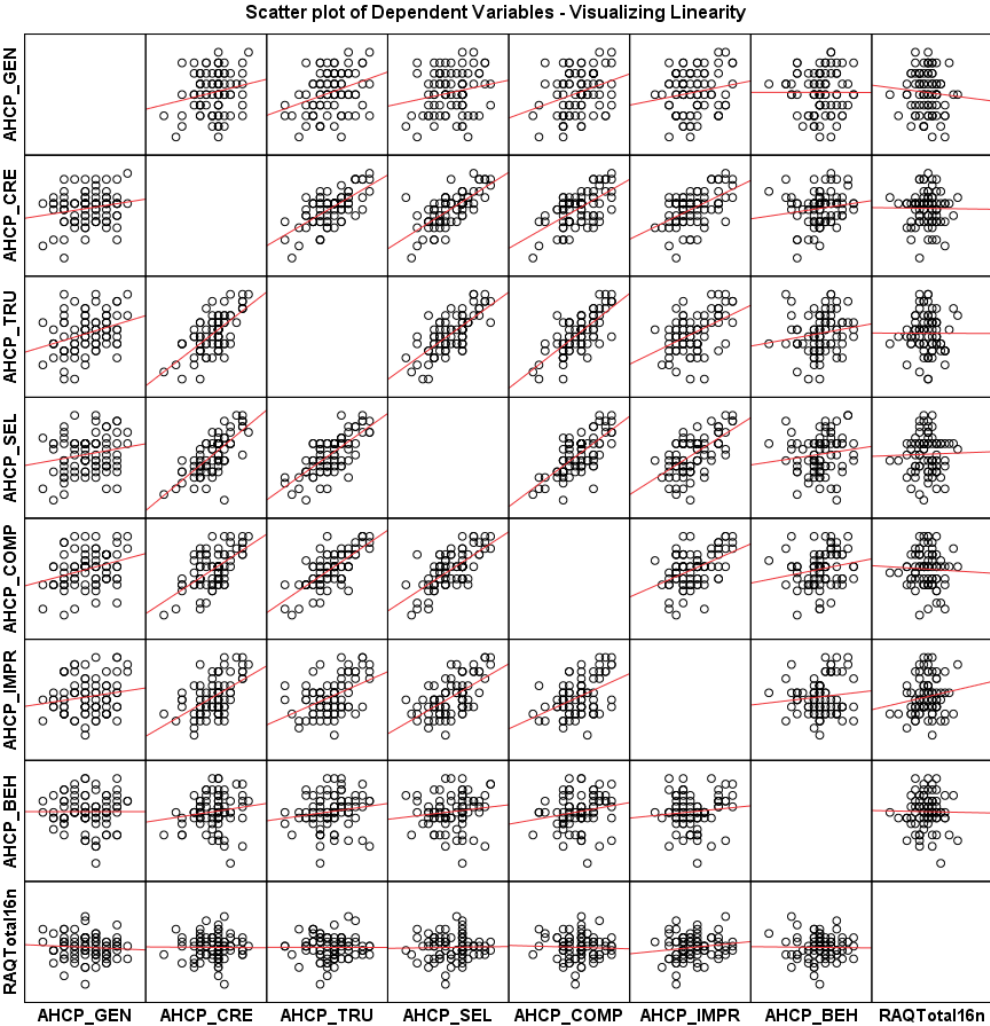
Considering that these are ordinal scales, the scatterplot provides satisfactory linearity. However, the RAQ scale performed as worse out of all the scales in every plot (separate by condition). Based on the scatterplot a better approach is probably to assess RAQ independently (i.e., in a One-Way ANCOVA), which may provide a better answer to Hypothesis 3.

Whilst variables should correlate, the correlation should not be too high otherwise there is a reason to suspect multicollinearity issue. To check multicollinearity, there are two methods of choice. The first is to consult correlation matrix and see if any correlations are too high. What is too high correlation is depending on the purpose of analysis. However, statistical problems

created by multicollinearity occur at correlation higher than .90 (Tabachnick & Fidell, 2012). In this case, there is no issue with collinearity.

Correlations

		AHCP_GEN	AHCP_CRE	AHCP_TRU	AHCP_SEL	AHCP_COMP	AHCP_IMPR	AHCP_BEH	RAQTotal16n
AHCP_GEN	Pearson Correlation	1							
AHCP_CRE	Pearson Correlation		1		.724**				
AHCP_TRU	Pearson Correlation			1	.717**	.731**			
AHCP_SEL	Pearson Correlation		.724**	.717**	1	.699**			
AHCP_COMP	Pearson Correlation			.731**	.699**	1			
AHCP_IMPR	Pearson Correlation						1		
AHCP_BEH	Pearson Correlation							1	
RAQTotal16n	Pearson Correlation								1

**. Correlation is significant at the 0.01 level (2-tailed).

Additionally, measuring multicollinearity of MANCOVA be done precisely through computation of Log Determinant which is a measure of within-cells correlation matrix (Tabachnick & Fidell, 2012). The interpretation of the determinant is straightforward (i.e., '*An extremely small determinant may indicate a problem with multicollinearity or singularity*' (Tabachnick & Fidell, 2012, p. 689). The Log(Determinant) = -3.21482 is not extremely small as multicollinearity or singularity determinants are zero.

Statistics for Within Cells correlations

Log(Determinant)	- 3.21482
Bartlett test of Sphericity	249.14834 with 28 D. F.
Significance	.000
F(max) criterion =	2.94223 with (8,81) D. F.

Homogeneity of variance-covariance matrix and homogeneity of error variances

The statistical package SPSS provide a very sensitive in-built test of homogeneity of dispersion matrices called the Box's test (Tabachnick & Fidell, 2012). If the test results significant then distortions in the alpha levels and Pillai's Trace should be used (Garson, 2012).

The results of Box's test of Equality od Covariance and Levene's test of Equality of Error Variance both non-significant at p > 05, therefore there is no need to assume non-homogeneity of error variances and the primary test of choice will be Wilk's Lambda (Tabachnick & Fidell, 2012).

Homogeneity of Regression slopes

The final assumption that is especially important for MANCOVA is to test the homogeneity of regression slopes. Additionally, the assumption should be tested at each step of breakdown in follow up-analyses (Tabachnick & Fidell, 2012). The table below provides an output of the analysis.

The primary goal of this analysis is to test whether condition is not affected by the covariate, for example, result of participants in particular condition are due to either BMI, Gender, Age, FS-cale, BAOP, or ATOP. This is crucial assumption to cover.

Multivariate Tests[a]

Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept	.672	4.857	8.000	19.000	.002
	.328	4.857	8.000	19.000	.002
	2.045	4.857	8.000	19.000	.002
	2.045	4.857	8.000	19.000	.002
Condition	1.795	1.078	56.000	175.000	.350
	.100	1.025	56.000	107.629	.448
	3.058	.944	56.000	121.000	.588
	.997	3.116[c]	8.000	25.000	.014
Condition * Age	1.750	1.042	56.000	175.000	.411
	.100	1.026	56.000	107.629	.446
	3.223	.995	56.000	121.000	.498
	1.564	4.889[c]	8.000	25.000	.001
Condition * Gender	1.842	1.116	56.000	175.000	.292
	.095	1.053	56.000	107.629	.403
	3.121	.964	56.000	121.000	.553
	1.175	3.673[c]	8.000	25.000	.006
Condition * BMI	2.081	1.322	56.000	175.000	.089
	.052	1.401	56.000	107.629	.068
	4.562	1.408	56.000	121.000	.061
	2.140	6.688[c]	8.000	25.000	.000
Condition * ATOP	1.315	.723	56.000	175.000	.921
	.203	.663	56.000	107.629	.954
	1.989	.614	56.000	121.000	.979
	.740	2.311[c]	8.000	25.000	.052
Condition * BAOP	1.870	1.139	56.000	175.000	.260
	.066	1.264	56.000	107.629	.150
	4.453	1.375	56.000	121.000	.075
	2.492	7.789[c]	8.000	25.000	.000
Condition * FScale	1.628	.947	56.000	175.000	.584
	.122	.918	56.000	107.629	.633
	2.834	.875	56.000	121.000	.709
	1.186	3.706[c]	8.000	25.000	.006

a. Design: Intercept + Condition + Age + Gender + BMI + ATOP + BAOP + FScale + Condition * Age + Condition * Gender + Condition * BMI + Condition * ATOP + Condition * BAOP + Condition * FScale

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Given results in table above (main effects not reported) it was assumed that there was no violation of homogeneity of regression slopes, despite the Roy's Largest Root significance. The

reason is that Wilk's Lambda is the primary statistics of choice, unless there is a reason to select Pillai's trace, i.e., Box's test resulted significant (Tabachnick & Fidell, 2012).

Reliability of scales

The final assumption is to assess reliability of scales (Field, 2013; Tabachnick & Fidell, 2012). *Reliability and Validity of Scales*

To assess reliability of following scales, the six Guttman's lower bounds of reliability were used (Guttman, 1945). All six lower bounds assess internal structure of the test (Revelle, 2011). The tests from SPSS outputs all six lambdas, i.e., L1 – L6. L3 is equivalent of Cronbach's alpha, L2 is more complex, however a better estimate than L3, therefore the following text reports L2 and L3 lambdas (Sijtsma, 2008).

Reliability Statistics for		ATOP	BAOP	F-Scale
Lambda	1	0.808	0.64	0.809
	2	0.862	0.748	0.879
	3	0.851	0.731	0.871
	4	0.88	0.761	0.771
	5	0.839	0.732	0.856
	6	0.895	0.773	0.907
N of Items		20	8	14

Looking at reliability statistics of ATOP, BAOP, and F-Scale presented above, no serious reliability issues were identified. Both Guttmann L3 and L2 were satisfactory.

Additionally, a correlation table was created to see whether the expected correlation patter emerges between ATOP and BAOP as described in research (Allison, Basile, & Yuker, 1991). The F – Scale was correlated negatively, which was expected.

Correlations

		ATOP	BAOP	FScale
ATOP	Pearson Correlation	1	.287**	-.573**
	Sig. (2-tailed)		.009	.000
	N	82	82	82
BAOP	Pearson Correlation	.287**	1	-.409**
	Sig. (2-tailed)	.009		.000
	N	82	82	82
FScale	Pearson Correlation	-.573**	-.409**	1
	Sig. (2-tailed)	.000	.000	
	N	82	82	82

**. Correlation is significant at the 0.01 level (2-tailed).

Reliability statistics for ACHP

Reliability Statistics for		Advice	Credit	Trust (Weight)	Trust (Stress)	Selec	Compa	Impress	Behav
Lambda	1	0.411	0.674	0.602	0.682	0.727	0.704	0.606	0.693
	2	0.615	0.846	0.758	0.859	0.91	0.885	0.764	0.871
	3	0.513	0.842	0.752	0.853	0.909	0.88	0.757	0.866
	4	0.831	0.787	0.784	0.82	0.82	0.871	0.589	0.857
	5	0.644	0.829	0.742	0.853	0.881	0.872	0.746	0.857
	6	0.676	0.828	0.74	0.841	0.911	0.875	0.749	0.858
N of Items		5	5	5	5	5	5	5	5

Overall the reliability test proved that the scales developed for the purpose of this study are reliable at measuring the proposed concepts. The lowest reliability scores had the General Advice scale, which suggest caution for interpretation of results related to the scale.

RAQ

Kuder-Richardson 20 was computed for RAQ, the test is computed automatically using SPSS in place of alpha reliability and measures the same, i.e., extent to which the measure assesses the a unified concept (Kubiszyn & Borich, 2012).

Because RAQ contains also items that are condition specific, two reliability tests were conducted. The overall score shows that the test is not reliable at measuring the same concept with worse reliability for the Stress version of test. This may negatively impact the results.

Kuder-Richardson 20 for RAQ

Condition	Scale
Stress	0.499
Weight	0.649
N of Items	16

4. Discussion

The current study had several aims, first aim was to identify whether HCPs with obesity are stigmatized by their potential patients. Results from the section about the Impression scale suggest that this might be the case. Respondents evaluated the obese HCPs in the least favourable impression in comparison to all the other HCPs. However, contradictory are the results from Compassion scale, which suggest that obese HCPs may be evaluated as e.g., more caring that the normal weight HCPs. Overall, the first aim of the study has been satisfied as the research provides additional information about obese HCPs stigmatization.

The second aim asked, whether is the obese stigma influenced by gender. On the side of the participants, no significant effects of gender across all measures were found. However, on the side of the HCPs, compassion scale is an example where gender seemed to have an impact. Female HCPs were evaluated positively, i.e., as more compassionate than the other HCPs (those providing stress, normal weight, and males) by respondents.

Third aim was to assess what sociodemographic characteristics are associated with weight stigmatization of obese HCPs. This research aim was not completely satisfied. While it was possible to identify which variables for example fuel the Selection and Credibility of HCPs, (i.e., fat phobic reactions), it was impossible to make a causal connection with the condition variable as none of the sociodemographic characteristics were directly related to the condition.

Fourth aim was to assess whether weight stigma towards obese HCPs affects the amount of recalled advice. This research aim was not fulfilled as the main scale measuring this aim was non-significant across all variables.

H1 was that *Participants who viewed the obese HCP, reported significantly more weight stigma than those who viewed the normal weight HCP.* Significant results were evident based on condition and participant responses on the Impression scale. Additional follow-up analyses revealed that participants who viewed the obese HCPs who delivered the consultation on weight, reported significantly more negative evaluations (e.g., they were perceived as unintelligent, lazy, and sloppy) in comparison to normal weight HCPs in both the stress condition and weight condition. This is in alignment with H1 which was *Participants who viewed the obese HCP, reported significantly more weight stigma than those who viewed the normal weight HCP.* There was no significant gender difference in any HCPs condition.

The impression scale requires participants to evaluate whether the HCP based on a range of stereotypes (e.g., sloppy, unintelligent). These stereotypes are based on those previously reported in literature (e.g., Puhl et al., 2013) about obese people. Participants reported impressions that obese HCP scored high on these stereotypes when controlling for additional variables. Furthermore, participants' BMI significantly and positively predicted responses obese HCPs where participants' with higher BMI reported more positive impressions about obese HCPs, compared to participants with a lower BMI who reported negative impressions. The significant follow up analysis demonstrates that the patients who attend consultations are likely to form different impressions of HCPs depending on the weight of the HCP but also the weight of the patient.

H2 was that *The weight stigma will be higher in the obese HCP condition when discussing obesity compared to the obese HCP condition when discussing stress and the normal weight HCP conditions when discussing stress and obesity.* Results suggested that participants perceive the Obese HCP as more compassionate compared to normal weight professional. Additionally, when the normal weight female HCP provided a consultation on weight, participants reported that they felt the HCP was more trustworthy than both the Female and Male normal weight HCPs in the Stress conditions. However, overall impression of Obese HCP when providing a consultation on weight management was significantly worse than normal weight HCP and stress HCP. This hypothesis cannot be safely resolved with the current evidence as more significant conditions are required, however it may also lead to a preliminary

interpretation where the obesity stigma towards HCPs is not always only negative, or positive but reflect a multi-facet nature of the weight stigma.

Whilst there were no differences based on participant gender or condition in the other conditions and scales, participant responses on the compassion scale showed that participants reported a perception that the obese female HCP was more compassionate in the weight condition compared to the normal weight female, obese male, and normal weight male HCP conditions. Participants in the obese female HCP in the weight condition also reported higher perceptions of compassion than the obese and normal weight HCPs in the stress condition. This means that the obese female HCP was perceived as, for example more caring, willing to listen, understanding patients concerns, than when the same HCP in the stress condition suggesting there is an effect based on the information provided. This suggest that obese HCPs might be more approachable when discussing weight compared to normal weight HCP.

These results, suggest that people may be more compassionate towards obese HCPs delivering consultations on weight which contradicts the assumption in **H3 that** *The HCP with obesity will be eliciting higher patient non-adherence, lesser professional credibility, lower patient's trust, lesser likelihood of being selected by potential patients, and lesser compassion as perceived by potential patients.*

H4 was that *Patients being addressed by obese HCPs will remember less of medical advice than patients addressed by normal weight HCPs*. Hypothesis 4 was not supported as there were no significant differences between conditions based on the information recalled by participants.

Finally, interesting information may also be derived from the F-Scale. The scale predicted a positive score for credibility and there was a negative likelihood of selecting a HCP, although it was not possible to tell whether it was obese or normal weight HCP, it makes sense to assume the negative evaluation is due to association of fatness with negative adjectives. Participants who reported higher fat phobia were less likely to select HCPs compared to those reporting lower fat phobia, but perceived them as more credible. This might be explained in a way that while patients perceive the HCPs as credible because they bear the information about health, they might not select them because they would like to have a normal weight doctor. Further research is required to corroborate this possible explanation for the findings as condition for credibility and selection were not significant.

Additional significant results are in the results section; however, these are the main findings of the study. See Figure below for an overview of the study findings.

Figure: Overview of the study findings
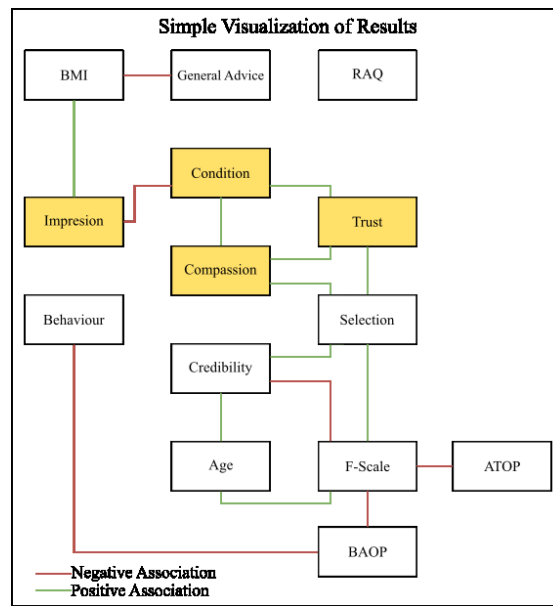
Practical implications

Despite the non-significance of the majority of the scales, the results suggesting the impression differs based on weight of healthcare professional are in line with previous evidence (Puhl et al., 2013). However, it also extends the current evidence base, by suggesting that HCPs gender may not play a role in the stigmatization of obese HCPs as there are other roles (i.e., being an authority as a doctor) that may mitigate weight stigma. Additionally, what seems to be important is the advice information in the consultation. Thus, the findings suggest that the HCPs personal BMI and weight as the topic of the consultation are the two main sources of weight stigma in a patient practitioner consultation. This is a novel finding as this has not been examined in previous studies.

Furthermore, the role of the HCP may be a positive factor in reducing weight stigma if the HCP is obese as they may be perceived as more compassionate. This association proved to be non-significant in other studies, therefore it should be explored further (Puhl et al., 2013).

Strengths and limitations

The study was first to assess HCPs stigmatization across different characteristics than weight itself whilst controlling for a variety of factors. The design was a blinded study with a random assignment of participants across condition. The study developed scales based on previous literature (Asimakopoulou et al., 2015; Puhl et al., 2013) and also used BAOP and ATOP scales

which have not been used previously in the HCPs weight stigmatization, despite being used elsewhere.

Additionally, the current study used video stimuli that was much closer to a real situation between HCP and their patients while controlling for other variables such as BMI, Gender, and Age. Although the research by Hash et al. (2003) assessed weight stigmatization in a real situation, they have lacked the control over Gender of HCPs and advice they were giving.

Finally, the research used non-student sample which may reflect normal patients much closer than for example college students and offered a novel variable to measure, i.e., recalled advice.

Despite the best efforts of researcher, the final sample size does not meet the estimates for required sample size which would be appropriate for statistical procedure and design of the current study. This is a limitation of the study that is likely causing uninterpretable results, and lack of statistical power.

Additionally, some respondents may have guessed that the condition is filmed in front of green screen and due to various technical difficulties with using body swap, they may have perceived the whole situation as unnatural.

Finally, the last limitation is the current research relied heavily on self-report measures. A possible extension that would provide more reliable measurements would be to use, e.g., eye tracking or similar method of assessing the weight stigma based on a perceived stimulus.

Future research

The current study will continue to collect data given the online nature of the study and therefore continue to contribute to the evidence of weight stigma in healthcare settings. Thus, participants will continue to be sampled until the estimated sample size is reached.

Additionally, if a lager sample is collected then more advanced methods of data analysis such as hierarchical modelling could be employed. This may ease the interpretability of results which depend on condition that is nesting multiple variables, i.e., gender, weight, information.

Lastly, the current research already opened a way to possible extensions of the research plan. As mentioned earlier an option would be to employ eye tracking to assess the weight stigma.

Conclusions

The study provides further evidence to results of Puhl et al. (2013) by addressing limitation of their research and other studies that used only photographs or images of people (Asimakopoulou et al., 2015; Puhl et al., 2013; Lovell, 2012; Hicks et al., 2008; Lovell et al. 2011). Furthermore, to the best knowledge of the author, this is the first study that controlled for Gender, Advice, and Weight of the HCPs. The findings suggest that while controlling for other factors, the compassion of obese HCPs may even be positive in comparison to non-obese HCPs. However, this is balanced by negative attitudes towards obese HCPs which were also found in the current study (i.e., through the impression scale).

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6. Appendix

6.1 Measures used in Study

Title: Impact of body shape on the patient-practitioner relationship study

This appendix contains all used measures. The document is split into following parts.
Administrative information *(such as debriefing and introduction and socio-demographics),*

Novel questionnaires *(any novel questionnaire that was developed for this study),*

Standardized questionnaires *(ATOP, BAOP, F Scale and IPAQ).*

Administrative information

General information

You have been provided with a unique link for the study on "Relationship between patient/client and healthcare professional". You have received this link because of your initial interest and preliminary agreement to participate in the study. Before you agree to take part you will be asked to provide informed consent. The following part that you will see, informs you about the study. Please read this information **carefully**.

In the first section of the study, you will be required to watch a video of a healthcare professional giving you a medical advice. Afterward, you will also be asked to complete several questionnaires. Your involvement in the study should last no more than 30 minutes. After completing the study, you will be directed to a page where you will see the email address of the principal investigator for any further questions you may wish to ask and you will receive a link to the debrief document.

As a participant involved in the study your responses will be anonymized so that there will be no chance of identifying your responses and your participation will remain **confidential at all times**. **You also have the right to withdraw or withhold any information at any point up until the point of publication**, without any penalty. **There are no known expected discomforts, no "disguised" procedures or unnecessary deception,** or risks through participation in this study.

This study will contribute towards much needed research in the patient/client and healthcare professional relationship and it is anticipated that the findings from this research will inform future practice. Before you continue, **please ensure you have read and understood the information above**. The procedure will take roughly 30 minutes. If you do not have 30 minutes right now, please close the browser and complete the study at another time. The study

will remain open for you to complete until 1:00 PM, 22.6. 2016.Please be aware that you can only complete the study once and that **once you start you cannot pause it or interrupt it**. If you experience any problems whilst completing the study, please contact the researcher.

 If you have any concerns or questions, please contact **Martin Čadek at cadekmar@gmail.com**

Declaration of informed Consent

Patient - practitioner relationship – Declaration of Informed Consent

Researched by Martin Čadek (cadekmar@gmail.com) and Dr Stuart Flint (S.Flint@shu.ac.uk)

1. I confirm that I have read the information page provided on the page before and have had the opportunity to consider the information and ask questions and had these answered satisfactorily.

2. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving a reason and without detriment to any treatment/service.

3. I agree that my name will not appear with the data.

4. I agree that any data collected may be passed to other researchers in anonymized form, and may appear in a report in the public domain, although it will not be possible to identify me from any material included.

5. I have been told that no "disguised" procedures or unnecessary deception exist in this study.

6. If I have any concerns then I may contact either Martin Čadek at cadekmar@gmail.com and Dr Stuart Flint on 0114 2255582 or by emailing: S.Flint@shu.ac.uk

I **agree** to take part in the study:

❍ Yes (1)
❍ No (2)

If No Is Selected, Then Skip To End of Survey

Please write down your **email.** The email serves as a way to help you in case you will experience any problems whilst completing the study. Your email is used exclusively for this research.

Goodbye page with information of next procedures, when they will receive Debrief and such.

Instructions for the following part

You have reached the final page of the study. We thank you for your participation and the time you have taken to complete this study. **Please click on the link below this paragraph, you will be redirected to a debrief document in PDF that describes the study in full detail.** You are free to download it and keep it. If you have any questions about the study you have just completed, please contact us at cadekmar@gmail.com. Remember, you are free to withdraw yourself from the study at any time of the study prior to a publication of results. If you wish to do so, please contact cadekmar@gmail.com. Thank you for participating in the study.

<p style="text-align: center;"><a
href="https://onedrive.live.com/redir?resid=7BE2547229B0EFF5!221&authkey=!ANm_j0sjsMYvaqY&ithint=file%2cpdf" target="_blank" >Download the Debrief Document</p>

Video instructions

Instructions for the following part

Please read this section carefully. In the next page your task will be **to watch a video** of a healthcare professional giving you advice.

The video is roughly 4 minutes in duration. After the video, you will be asked to respond to a variety of questionnaires.

All of the pages are automated (the video will play automatically, stop automatically) so you can sit comfortably and watch the video. **Please do not try to stop the video by clicking on it.** At the end of the video, you will automatically move to the next page. Before you continue, please answer following questions.

12.3 I am in an environment where I will **not be disturbed**. If you select NO, the questionnaire will terminate and you will be provided with another opportunity to complete the study.

❍ Yes (1)
❍ No (2)

If No Is Selected, Then Skip To End of Survey

12.4 **Only my browser and the tab window** with the current questionnaire is open. If NO is selected the questionnaire will terminate and you will be provided with another opportunity to complete the study.

❍ Yes (1)
❍ No (2)

If No Is Selected, Then Skip To End of Survey

Novel questionnaires

Recalled Advice Questionnaire (RAQ) – Female Version, Stress Version

Q266 Instructions for the following part

Following the questionnaire, we will ask you to **recall some information from the video**. Please ensure that only browser with the tab of the questionnaire page is open. **Finally, if you do not know an answer to the question**, please simply write '**999**' or '**I do not know**'. When you feel that you have familiarized yourself with instructions above, please continue.

14.5 **The following questions are related to the video you have just watched.**

14.7 Do you remember what Dr Anna Lee's **specialization** was?

14.8 What did Dr Anna Lee say her goal today was **to inform you about**?

14.9 Please describe how did Dr Anna Lee **looked**?

14.10 Do you remember **anything else** about Dr Anna Lee?

14.11 Can you please **describe the place** where Dr Anna Lee was standing?

14.12 Please provide the **definition of stress** according to the video?

14.13 According to the video roughly what **percentage of all work-related ill health cases** are attributed to stress?

14.14 What **percentage of working days** is lost due to ill health according to the video?

14.15 In the video, **which occupations** are reported as having higher levels of stress?

14.16 In the video, **how many working days** in 2015 were roughly lost due to stress in UK?

14.17 In the video, how much **physical activity** over a week is good for adults?

14.18 In the video, **what intensity** should your physical activity be?

14.19 Please recall the **examples** of recommended physical activity?

14.21 In the video, Dr Anna Lee provided **some suggestions** of what you can do when you feel under pressure during work. What were these?

14.22 Please name **the activities** that the healthcare professional suggested to improve time management?

14.23 What **options** did the healthcare professional suggest **to quit smoking**?

14.24 In the video, what advice did the healthcare professional suggest **regarding sitting**?

14.25 In the video, **how many hours** did the healthcare professional suggested you view TV per day?

14.26 What advice did the healthcare professional give for **alcohol consumption**?

Recalled Advice Questionnaire (RAQ) – Male Version, Stress Version

120.7 Do you remember what Dr David Broom's **specialization** was?

120.8 What did Dr David Broom say his goal today was **to inform you about**?

120.9 Please describe how did Dr David Broom **looked**?

120.10 Do you remember **anything else** about Dr David Broom?

120.11 Can you please **describe the place** where Dr David Broom was standing?

120.12 Please provide the **definition of stress** according to the video?

120.13 According to the video roughly what **percentage of all work-related ill health cases** are attributed to stress?

120.14 What **percentage of working days** is lost due to ill health according to the video?

120.15 In the video, **which occupations** are reported as having higher levels of stress?

120.16 In the video, **how many working days** in 2015 were roughly lost due to stress in UK?

120.17 In the video, how much **physical activity** over a week is good for adults?

120.18 In the video, **what intensity** should your physical activity be?

120.19 Please recall the **examples** of recommended physical activity?

120.21 In the video, Dr David Broom provided **some suggestions** of what you can do when you feel under pressure during work. What were these?

120.22 Please name **the activities** that the healthcare professional suggested to improve time management?

120.23 What **options** did the healthcare professional suggest **to quit smoking**?

120.24 In the video, what advice did the healthcare professional suggest **regarding sitting**?

120.25 In the video, **how many hours** did the healthcare professional suggested you view TV per day?

120.26 What advice did the healthcare professional give for **alcohol consumption**?

Recalled Advice Questionnaire (RAQ) – Female Version, Weight Version

18.7 Do you remember what Dr Anna Lee's **specialization** was?

18.8 What did Dr Anna Lee say her goal today was **to inform you about**?

18.9 Please describe how did Dr Anna Lee **looked**?

18.10 Do you remember **anything else** about Dr Anna Lee?

18.11 Can you please **describe the place** where Dr Anna Lee was standing?

18.12 In the video, what was the **body mass index (hereafter BMI)** for a healthy weight?

18.13 In the video, what was the **approximate mean BMI** in 2012 in the UK?

18.14 In the video, UK adults with a healthy weight were in minority. Can you remember the approximate **percentage of men and women in a health weight**?

18.15 In the video, roughly **how many adults were obese** in 2014 in UK?

18.16 In the video, can you remember **the percentage of adults classified as overweight** in the UK?

18.17 In the video, how much **physical activity** over a week is good for adults?

18.18 In the video, **what intensity** should your physical activity be?

18.19 Please recall the **examples** of recommended physical activity?

18.20 In the video, what should you **substitute high sugar drinks** including sport drinks with?

18.21 In the video, which energy dense foods could you **remove** from your diet as suggested?

18.22 In the video, what can you use as a **guide for appropriate portion sizes**?

18.24 In the video, what advice did the healthcare professional suggest **regarding sitting**?

18.25 In the video, **how many hours** did the healthcare professional suggested you view TV per day?

18.26 What advice did the healthcare professional give for **alcohol consumption**?

Recalled Advice Questionnaire (RAQ) – Male Version, Weight Version

119.7 Do you remember what Dr David Broom's **specialization** was?

119.8 What did Dr David Broom say his goal today was **to inform you about**?

119.9 Please describe how did Dr David Broom **looked**?

119.10 Do you remember **anything else** about Dr David Broom?

119.11 Can you please **describe the place** where Dr David Broom was standing?

119.12 In the video, what was the **body mass index (hereafter BMI)** for a healthy weight?

119.13 In the video, what was the **approximate mean BMI** in 2012 in the UK?

119.14 In the video, UK adults with a healthy weight were in minority. Can you remember the approximate **percentage of men and women in a health weight**?

119.15 In the video, roughly **how many adults were obese** in 2014 in UK?

119.16 In the video, can you remember **the percentage of adults classified as overweight** in the UK?

119.17 In the video, how much **physical activity** over a week is good for adults?

119.18 In the video, **what intensity** should your physical activity be?

119.19 Please recall the **examples** of recommended physical activity?

119.20 In the video, what should you **substitute high sugar drinks** including sport drinks with?

119.21 In the video, which energy dense foods could you **remove** from your diet as suggested?

119.22 In the video, what can you use as a **guide for appropriate portion sizes**?

119.24 In the video, what advice did the healthcare professional suggest **regarding sitting**?

119.25 In the video, **how many hours** did the healthcare professional suggested you view TV per day?

119.26 What advice did the healthcare professional give for **alcohol consumption**?

Attitudes Towards Healthcare Professional (AHCP)

<u>Instructions</u>

In the following part you are going to be asked to mark **37 statements** according to how much do you agree or disagree with each of the statements. **You cannot skip** any statement. You will be provided with a scale to indicate your response.

*Please **read the statement displayed below** and **mark on the scale how much do you agree or disagree** with the statement. The numbers above the scale serve as a guidance. Higher numbers are considered that you agree more.*

Scale: Strongly Disagree / Disagree / Agree / Strongly agree

General Advice Adherence (Higher scores, higher likelihood of following HCP advice)

I intend to **follow** the healthcare professional's **instructions**.

I am **not sure** how to **follow** the healthcare professional's **advice**. (Negative)

I **don't think** it would take much effort for me to **follow** the healthcare professional's **advice**.

It may be **difficult** for me to **follow** the **advice** of the healthcare professional. (Negative)

I **plan to use** the healthcare professional's medical **advice tactics** from the video.

Professional credibility (Higher scores, higher doubts)

I have **doubts** about the healthcare professional's **credibility**. (Negative)

The healthcare professional in the video is someone I would have **respect** for.

The healthcare professional in the video seemed to **know what he or she was talking about**.

I am **confident** in the **ability** of the healthcare professional in the video.

The healthcare professional in the video seemed to **lack enough experience**. (Negative)

Patient's trust (Higher scores, higher trust)

I **do not trust** the healthcare professional in the video. (Negative)

I would feel **comfortable to express my concerns** about my body to the healthcare professional in the video.

I would **find it difficult** to tell the healthcare professional in the video about **private things**. (Negative)

I would **feel embarrassed** in front of the healthcare professional in the video. (Negative)

I am **confident** that the healthcare professional in the video would keep my **personal information confidential**.

Patient's trust (by condition)

I would feel **comfortable** to **consult my diet** with the dietitian in the video. (Diet Condition)

I would feel **comfortable** to **consult stressful situations** with the psychologist in the video. (Stress Condition)

I would feel **comfortable** to **talk about losing weight** to the dietitian in the video. (Diet Condition)

I would feel **comfortable** to **discuss smoking cessation** with the psychologist in the video. (Stress Condition)

Selecting HCP (Higher scores, higher hypothetical likelihood of selecting this HCP)

I would **choose** the healthcare professional in the video **for a consultation**.

I would **hesitate to recommend** the healthcare professional in the video to **my friends**. (Negative)

I would **hesitate to recommend** the healthcare professional in the video to **anybody**. (Negative)

I would **be completely happy** to see this healthcare professional for an advice **again**.

It would be **fantastic** if such a healthcare professional would be in **my neighbourhood**.

Compassion (Higher scores, higher compassion)

I believe the healthcare professional in the video would **listen carefully to what I have to say**.

I believe the healthcare professional in the video would **understand my concerns**.

I would feel **comfortable** when talking to the healthcare professional in the video about my health concerns.

The healthcare professional in the video **seemed caring**.

I felt that the healthcare professional in the video would be **interested in me as a person** not just my illness.

Patient's impression about stereotypes towards the HCP (Higher score, more positive impression)

The healthcare professional in the video **seemed sloppy**.

The healthcare professional in the video **seemed unintelligent**.

The healthcare professional in the video **seemed lazy**.

I felt that the healthcare professional in the video **should manage his or her weight better**.

I found the healthcare professional in the video **unattractive**.

Health behaviours of the healthcare professional (Higher score, higher need for healthy behaviours of HCP)

In general, healthcare professionals should **not smoke cigarettes**.

In general, healthcare professionals should **not drink alcohol**.

In general, healthcare professionals should **exercise regularly**.

In general, healthcare professionals should **eat a well-balanced diet**.

In general, healthcare professionals should **manage their own stress fine**.

Sociodemographic Questionnaire

113.1 Instructions for the following part

You are almost at **the end of the study**. The last part is a socio-demographic questionnaire. There are several questions about your background. Some questions may be perceived **as sensitive**. This part should take no more than 10 minutes to complete.

113.1.1 Please indicate your **nationality** (e.g. United Kingdom, United States, Japan)?

Text field

113.2 What is your sex?

❍ Male (1)
❍ Female (2)

113.3 Are you an English native speaker?

○ Yes I am (1)
○ No I am Not (2)

113.4 Are you **fluent in English?** (i.e. you can understand all of the questions and information in the video, and you had no problems writing your answers in English.)

○ Yes, I am fluent in English (1)
○ No, I am not fluent in English (2)

113.5 What is **your date of birth**? (Please answer in following format: mm/dd/yyyy)

113.6 What is your height?

	feet (1)	inches (2)	OR centimeters (optional) (3)
What is you height in feet and inches or centimeters? (1)			

113.7 What is your weight?

	pounds (1)	OR kilograms (optional) (2)
Your weight in pounds or kg? (1)		

113.8 Are you currently employed in or studying in any of the following fields?

○ Medicine (Including: Health Care, Physical Education and Nutrition) (1)
○ Psychology (Including: Psychotherapy and Coaching) (2)
○ I am NOT an employee or I am NOT a student in any of the fields above (3)

113.9 In past 14 days, have you visited a dietitian, psychologist or general practitioner?

○ Yes (1)
○ No (2)

If Yes Is Selected, Then Skip To Please select all that apply. If none...If No Is Selected, Then Skip To Did you ever scheduled an appointment...

113.10 Have you ever scheduled an appointment with a dietitian or psychotherapist?

○ Yes (1)
○ No (2)

If No Is Selected, Then Skip To We are interested in finding out about...

113.11 In previous visits to see your healthcare professional (e.g.: dietitian, general practitioner or psychologist), have you **discussed any of the following topics**: Please select all that apply. If none apply do not select anything.

❑ stress management (1)
❑ weight management (2)
❑ dietary advice (3)
❑ physical activity advice (4)
❑ smoking cessation (5)
❑ time management (6)
❑ healthy eating (7)

other services directly related to stress or weight management (8)

113.4 Do you **smoke** cigarettes?

Yes / No

113.41 **How many cigarettes/day do you smoke?**

10 or less, 11-20, 21-30, 31 or more

113.5 Do you consume drinks containing **alcohol**?

Yes / No

113.51 **How many** drinks containing alcohol do you have on a typical day when you are drinking?

1 or 2, 3 or 4, 5 or 6, 7 to 9, 10 or more

113.6 Please estimate your **annual income** from the **last year** (That is your income for 12 months in year 2015, i.e. £13,124).

Text field

Standardized Questionnaires

ATOP

110.1 Instructions for the following part

In the following part you are going to be asked to mark 20 statements according to how much do you agree or disagree with each of the statements. You cannot skip any statement. You will be provided with a scale to indicate your response.

110.2 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese people are as happy as nonobese people.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.3 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Most obese people feel that they are not as good as other people.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.4 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Most obese people are more self-conscious than other people.

❍ -3 Strongly disagree (1)
❍ -2 Moderately disagree (2)
❍ -1 Slightly disagree (3)
❍ +1 Slightly agree (4)
❍ +2 Moderately agree (5)
❍ +3 Strongly agree (6)

110.5 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese workers cannot be as successful as other workers.

❍ -3 Strongly disagree (1)
❍ -2 Moderately disagree (2)
❍ -1 Slightly disagree (3)
❍ +1 Slightly agree (4)
❍ +2 Moderately agree (5)
❍ +3 Strongly agree (6)

110.6 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Most nonobese people would not want to marry anyone who is obese.

❍ -3 Strongly disagree (1)
❍ -2 Moderately disagree (2)

○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.7 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Severely obese people are usually untidy.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.8 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese people are usually sociable.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.9 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Most obese people are not dissatisfied with themselves.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.10 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese people are just as self-confident as other people.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.11 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Most people feel uncomfortable when they associate with obese people.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.12 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese people are often less aggressive than nonobese people.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.13 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Most obese people have different personalities than nonobese people.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

110.14 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Very few obese people are ashamed of their weight.

- ⭕ -3 Strongly disagree (1)
- ⭕ -2 Moderately disagree (2)
- ⭕ -1 Slightly disagree (3)
- ⭕ +1 Slightly agree (4)
- ⭕ +2 Moderately agree (5)
- ⭕ +3 Strongly agree (6)

110.15 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Most obese people resent normal weight people.

- ⭕ -3 Strongly disagree (1)
- ⭕ -2 Moderately disagree (2)
- ⭕ -1 Slightly disagree (3)
- ⭕ +1 Slightly agree (4)
- ⭕ +2 Moderately agree (5)
- ⭕ +3 Strongly agree (6)

110.16 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese people are more emotional than nonobese people.

- ❍ -3 Strongly disagree (1)
- ❍ -2 Moderately disagree (2)
- ❍ -1 Slightly disagree (3)
- ❍ +1 Slightly agree (4)
- ❍ +2 Moderately agree (5)
- ❍ +3 Strongly agree (6)

110.17 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese people should not expect to lead normal lives.

- ❍ -3 Strongly disagree (1)
- ❍ -2 Moderately disagree (2)
- ❍ -1 Slightly disagree (3)
- ❍ +1 Slightly agree (4)
- ❍ +2 Moderately agree (5)
- ❍ +3 Strongly agree (6)

110.18 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese people are just as healthy as nonobese people.

❍ -3 Strongly disagree (1)
❍ -2 Moderately disagree (2)
❍ -1 Slightly disagree (3)
❍ +1 Slightly agree (4)
❍ +2 Moderately agree (5)
❍ +3 Strongly agree (6)

110.19 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese people are just as sexually attractive as nonobese people.

❍ -3 Strongly disagree (1)
❍ -2 Moderately disagree (2)
❍ -1 Slightly disagree (3)
❍ +1 Slightly agree (4)
❍ +2 Moderately agree (5)
❍ +3 Strongly agree (6)

110.20 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obese people tend to have family problems.

❍ -3 Strongly disagree (1)
❍ -2 Moderately disagree (2)
❍ -1 Slightly disagree (3)
❍ +1 Slightly agree (4)
❍ +2 Moderately agree (5)
❍ +3 Strongly agree (6)

110.21 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

One of the worst things that could happen to a person would be for him to become obese.

❍ -3 Strongly disagree (1)
❍ -2 Moderately disagree (2)
❍ -1 Slightly disagree (3)
❍ +1 Slightly agree (4)
❍ +2 Moderately agree (5)
❍ +3 Strongly agree (6)

BAOP

111.1 Instructions for the following part   In the following part you are going to be asked to mark 8 statements according to how much do you agree or disagree with each of the

statements. You cannot skip any statement. You will be provided with a scale to indicate your response.

111.2 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obesity often occurs when eating is used as a form of compensation for lack of love or attention.

❍ -3 Strongly disagree (1)
❍ -2 Moderately disagree (2)
❍ -1 Slightly disagree (3)
❍ +1 Slightly agree (4)
❍ +2 Moderately agree (5)
❍ +3 Strongly agree (6)

111.3 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

In many cases, obesity is the result of biological disorder.

❍ -3 Strongly disagree (1)
❍ -2 Moderately disagree (2)
❍ -1 Slightly disagree (3)
❍ +1 Slightly agree (4)
❍ +2 Moderately agree (5)
❍ +3 Strongly agree (6)

111.4 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obesity is usually caused by overeating.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

111.5 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Most obese people cause their problem by not getting enough exercise.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

111.6 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Most obese people eat more than nonobese.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

111.7 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

The majority of obese people have poor eating habits that lead to their obesity.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

111.8 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

Obesity is rarely cause by a lack of willpower.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

111.9 Please read the statement displayed below and mark on the scale provided below how much do you agree or disagree with the statement. The numbers above the scale serve as a guidance.

People can be addicted to food, just as others are addicted to drugs, and these people usually become obese.

○ -3 Strongly disagree (1)
○ -2 Moderately disagree (2)
○ -1 Slightly disagree (3)
○ +1 Slightly agree (4)
○ +2 Moderately agree (5)
○ +3 Strongly agree (6)

F-SCALE

112.1 Instructions for the following part   In the following part you are about to complete 14 pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, you are asked to choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

112.2 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
lazy:industrious (1)	❍	❍	❍	❍	❍

112.3 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
no will power:has will power (1)	❍	❍	❍	❍	❍

112.4 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
attractive:unattractive (1)	❍	❍	❍	❍	❍

112.5 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
good self-control:poor self-control (1)	○	○	○	○	○

112.6 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
fast:slow (1)	○	○	○	○	○

112.7 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
having endurance:having no endurance (1)	○	○	○	○	○

112.8 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
active:inactive (1)	○	○	○	○	○

112.9 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
weak:strong (1)	❍	❍	❍	❍	❍

112.10 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
self-indulgent:self-sacrificing (1)	❍	❍	❍	❍	❍

112.11 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
dislikes food:likes food (1)	❍	❍	❍	❍	❍

112.12 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
shapeless:shapely (1)	❍	❍	❍	❍	❍

112.13 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
undereats:overeats (1)	❍	❍	❍	❍	❍

112.14 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
insecure:secure (1)	❍	❍	❍	❍	❍

112.15 Listed below is a pair of adjectives sometimes used to describe obese or fat people. For each adjective pair, please choose a point on the line closest to the adjective that you feel best describes your feelings and beliefs.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
low self-esteem:high self-esteem (1)	❍	❍	❍	❍	❍

IPAQ – This questionnaire is administrated after Socio-demographic (or rather as part of it)

113.12 We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to

be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

113.13 Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	0 (No vigorous physical activities) (8)
Days per week: (1)	❍	❍	❍	❍	❍	❍	❍	❍

If Days per week: - 0 (No vigo... Is Selected, Then Skip To Think about all the moderate activiti...

113.14 How much time did you usually spend doing vigorous physical activities on one of those days? (If you don't know or you are not sure, write down 999.)

　　　hours a day (1)
　　　minutes per day (2)

113.15 Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a

time. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	0 (No moderate physical activities) (8)
Days per week: (1)	❍	❍	❍	❍	❍	❍	❍	❍

113.16 How much time did you usually spend doing moderate physical activities on one of those days? (If you don't know or you are not sure, write down 999.)

Hours per day: (1)
Minutes per day: (2)

113.17 Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	0 (No walking at all) (8)
Days per week: (1)	❍	❍	❍	❍	❍	❍	❍	❍

113.18 How much time did you usually spend walking on one of those days? (If you don't know or you are not sure, write down 999.)

Hours per day: (1)
Minutes per day (2)

113.19 The last question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.   During the last 7 days, how much time did you spend sitting on a week day?   (If you don't know or you are not sure, write down 999.)

Hours per day (1)
Minutes per day (2)

Perceived Stress Scale – 4 (Part of sociodemographic questionnaire)

0=never ____1=almost never ____2=sometimes ____3=fairly often ____4=very often

113.71 In the **last month**, how often have you felt that you were unable to control the important things in your life?

113.72 In the **last month**, how often have you felt confident about your ability to handle your personal problems?

113.73 In the **last month**, how often have you felt that things were going your way?

113.74 In the **last month**, how often have you felt difficulties were piling up so high that you could not overcome them?

6.2 Script

Preventing excess weight gain advice (EWG condition)

Advice

Hello I'm Dr David Broom and I am a dietitian. My goal today is to inform you about how to prevent excess weight gain.

First of all let's talk about what excess weight is and how do we define it. A healthy weight is defined by a body mass index or BMI of 18.5 to 24.9 kg/m2. In 2014, the mean BMI of adults in England was approximately 27. The minority of adults had a healthy weight with only 38% of men and 41% of women in this category.

The majority of adults are either overweight which is a BMI of 25 to 29.9 or obese which is a BMI of 30 or over. In 2012, a quarter of all adults were obese and 60% of adults are overweight.

Given the current situation, health professionals would like to help people to keep their excess weight down.

In order to do this, I am going to share with you several guidance tactics all from the latest scientific evidence:

Firstly drinking water instead of drinks containing high amounts of sugar including sports drinks is very important. This small change can be surprisingly helpful.

Secondly, engaging in physical activity is extremely beneficial. A good amount of physical activity for an adult to do over a week is 150 minutes or 2 and a half hours of moderate intensity activity. Examples of such activities are jogging, dancing, and gardening and this can be broken down into bouts of 10 minutes of activity. If you are unsure of what moderate intensity activity is think about exercising at 50-60% of your maximum capacity.

In order to keep your weight in check, it is also important to remove high energy dense foods from your diet such as fried foods, biscuits, savoury snacks, confectionery and drinks made with full fat milk or cream. To follow these guidelines, it may be helpful to check portion size by looking at the labels of food. Smart phone applications are also very useful here. Be aware that food perceived as healthy such as olive oil, nuts and fruit juices can contribute excess weight. The first thing you can do is to reduce overall energy density of the diet. This includes consuming less of food such as olive oil, fruit juice or nuts, which can contribute to weight gain if you consume large amounts of them.

It is also important to consider your alcohol intake. Men and women should not regularly consume more than 14 units of alcohol. Regularly means drinking this amount on most or all days of the week.

Although we all enjoy sitting, it is also important to break up your sitting whilst at home and in work. It is important to use the stairs and strategies to reduce our TV viewing time and other leisure screen activities include having a TV free day or limiting your TV viewing time to 2 hours per day.

I hope that you find this information useful and thank you for attending this consultation. Goodbye.

Preventing cardiovascular diseases (CVD condition)

Advice

Hello I'm Dr David Broom I am a psychologist. My goal today is to inform you about how to prevent and reduce stress.

First let's start by defining what we mean by the term stress. This is when we are feeling under increased amounts of mental or emotional pressure. In the UK, stress accounted for 35% of all work related ill health cases are due to stress and 43% of all working days are lost to stress.

Occupations in public service experience higher levels of stress compared to other services. This includes teachers, health professionals and pther public service professsionals. In the UK in 2015, 9.9 million days were lost to stress in the workplace.

Stress has various health consequences and it reduces your quality of life. However, stress is manageable and can be prevented at all ages. Therefore health professionals would like share some guidance on how to do this and this is the key message of this consultation.

The first thing you can do it to develop and confide in a support network of colleagues, friends and family. This can help ease your work troubles and help you to see things in a different light.

When feeling under pressure, take a break from work and clear your thoughts. This will help you feel calmer, relaxed and focused when you return to the task. Consider your time management Managing your time effectively can help you to feel more relaxed, focused and in control. Here using a diary or personal organiser to work towards a more balanced lifestyle. Other options include making to-do lists, ensuring you take a lunch break instead of working through, and to prioritise your tasks.

Secondly, engaging in physical active is extremely beneficial in reducing your stress levels. A good amount of physical activity for an adult to do over a week is 150 minutes or 2 and a half hours of moderate intensity activity. Examples of such activities are jogging, dancing, and gardening and this can be broken down into bouts of 10 minutes of activity. If you are unsure of what moderate intensity activity is think about exercising at 50-60% of your maximum capacity.

Although we can offer some general advice to everyone, it is important to know your individual differences. If you smoke, it is important to work towards quitting. You can ask your doctor about smoking cessation services. Alternatively, you could try pharmacotherapy if you do not wish to try smoking cessation services. You can also visit the NHS website and see variety of healthy choices they advise.

Although we all enjoy sitting, it is also important to break up your sitting whilst at home and in work. It is important to use the stairs and strategies to reduce our TV viewing time and other

leisure screen activities include having a TV free day or limiting your TV viewing time to 2 hours per day. The last guidance concerns alcohol consumption

It is also important to consider your alcohol intake. Men and women should not regularly consume more than 14 units of alcohol. Regularly means drinking this amount on most or all days of the week.

I hope that you find this information useful and thank you for attending this consultation. Goodbye.

6.3 Debrief

DEBRIEF DOCUMENT

You were informed that the aim of the study was to examine the *Relationship between patient/client and healthcare professional*. Whilst this was the aim of the study, the full aim was to examine whether patients discriminate obese healthcare professionals compared to normal weight healthcare professionals. Media depictions often present obese people as lazy, having less social interactions, pertaining to lower social classes, and being less educated. It has been suggested that obese healthcare professionals may experience similar stigmatisation.

As part of the study, you viewed a video of a healthcare professional providing advice. There were other participants who saw the video with the same person; however, the weight of that person was modified (either to be depicted as obese or non-obese). Your participation also included conscious measures of attitudes towards obese people and questions relating to your perception of the healthcare professional in the video. Responses to these measures will be compared to find out if there are any differences between participants who viewed the different videos. As part of this study, we are also examining the impact of the healthcare professional's gender, the advice they gave, and the BMI of the healthcare professional. These characteristics will be examined to determine whether they are associated with stigmatisating attitudes reported previously. If you have any questions about your participation and the findings of this study, please do not hesitate to contact the researchers Martin Čadek at cademar@gmail.com and Dr Stuart Flint at s.flint@shu.ac.uk or +44(0)1142255582. We are happy to receive any potential questions about the study or provide further clarification about the study.

We would like to take this opportunity to thank you again for your participation.