Master thesis:

The association of obesity and quality of life in the Dutch province Flevoland in 2016.

Institution: Rijksuniversiteit Groningen

Faculty: Spatial sciences

Department: Population Studies

Student: Jurre de Vries (S3077551)

Supervisors: Janine Venema & Billie de Haas.

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rijksuniversiteit groningen

Preface

During my internship at the GGD Flevoland I worked with data from the local health monitor that had been performed 4 years prior. During this internship, I experienced first-hand to work with large datasets. During this time, the interest in obesity and the quality-of-life grew by speaking to people who were working in obesity prevention. Thereafter, the GGD Flevoland had lots of usable data on the quality-of-life related topics. However, there was no effort being made to combine the obesity with the quality-of-life related topics. As a result, I decided to combine both subjects in this thesis. Therefore, in this thesis I specifically wanted to analyse if obesity had any relationship with the quality of life. Mostly, because obesity is often associated with physical health while the mental, social and environmental associations are often neglected in research and prevention. Inspired to add a small puzzle piece to a larger debate I decided to work with literature and data to give more insights in the association between obesity and the quality of life.

Abstract

The aim of this thesis is to analyse association between the quality of life (QoL) and obesity for the population of Flevoland in the Netherlands. Multiple studies have shown an association between specific parts of the QoL and obesity. However, there is still little known on the social, mental and environmental domains compared to the physical domain. The data used in this thesis comes from the health monitor (2016) that has been performed in Flevoland (N=5220). The results of the analyses are supported by the literature presented in this thesis and concluded that there is indeed a negative association between obesity and the QoL. Especially, the mental and social domain show promising results that can be a base for further research on the relationship between the QoL and obesity.

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1. Introduction

In recent years obesity seems to be an ever-increasing problem for healthcare systems to cope with. For example, in the Netherlands the obesity prevalence rate in 1990 was approximately 6% while in 2019 the obesity prevalence rate reached 14,5% of the population. Hence, 14,5% of the people suffer from obesity and thus from a body mass index higher than 30 (BMI $\geq$ 30 kg/m^2). Next to this, 31,4% of the population are classified as being overweight with an body mass index above 25 (BMI $\geq$ 25 kg/m^2) (CBS-statline 2020). Hence, close to half of the population is at least somewhat overweight.

To specify the problem, obesity is often linked to an increase in the prevalence of non-communicable diseases (Boutayeb & Boutayeb, 2005). In addition, the World Health Organisation (WHO) stated that obesity is now considered an epidemic and therefore considered a threat to individual health for large population across many continents (Daansen 2010; WHO 2020). Next to this, multiple studies show that obesity is associated with the different levels of quality of life such as the environmental, social, mental and physical level (Busutil *et. al* 2017; Jia and Lubetkin 2010; Leahey *et al*. 2015). Especially, the detrimental physical effects of obesity on populations such as heart diseases, strokes, high blood pressure type 2 diabetes and osteoarthritis are well studied and commonly known (Bell *et al.* 2018; Guh *et al.* 2009; The New England journal of medicine, 2015).

Specific for the Netherlands, there is limited research available on the association between obesity and the quality-of-life related topics (Wouterse *et al.* 2011). More recently, studies that focus on obesity and the quality of life in the Netherlands concluded that obesity also has a negative impact on some aspects on the quality of life in adolescents (Wouterse *et al.* 2011). Therefore, existing literature on the quality of life is mostly from sources outside of the Netherlands. Although comparable, still there are many differences to be found between these countries, such as differences in the culture and differences between the health care systems. Next to this, the main of the national health organisation in the Netherlands seems to be focussed on reducing the prevalence of obesity to reduce healthcare cost and other wealth related costs. As an example, the main website on obesity prevention in the Netherlands, states that the consequences of obesity are related to physical health and mental health, high cost for the healthcare systems, increased pressure on the healthcare systems and indirect cost for the society due to increased physical health problems among workers (Samenwerken bij preventie overgewicht, 2021). To be fair, there is indeed an increase in knowledge and realisation of importance of the well-being of individuals in relationship to health. However, especially

local/national data seems to be lacking on the possible association between obesity and the quality-of-life.

Importance

In contrast, besides the ethical reasons for striving for an improvement in the quality of life of individuals, studies have shown that the quality of life plays an important role in the treatment of chronical diseases (Carod-Artal and Egido, 2009). For instance, a higher perceived quality of life is often associated with improvement of physical health and this will in return be important to combat a diverse range of diseases (Carod-Artal and Egido, 2009). Consequently, a low perceived level of quality of life can have negative effects on many aspects of life and health. To specify, the self-perceived quality of life is divided between the physical domain, social domain, mental domain and the environmental domain. Firstly, the social domain consists for instance of the perceived levels of feeling of loneliness, the lack or presence of a support system and experienced connectivity with other individuals (Helgeson, 2003). Secondly, the mental domain includes the amount of control in a person's life, the feeling of sad mood, the feeling of a low self-worth and the feeling of helplessness (Connell O'Cathain and Brazier, 2014). The environmental domain is defined as the financial situation, the living conditions and living environment (Preedy and Watson, 2010). To illustrate the importance of the quality of life, a lack of friends and the lack of close contacts can have detrimental effects on mental health (Lee and Szinovacz, 2016). In addition, limitations in daily activities due to mental and social factors can also be associated with the physical and mental health.

Aim

Although, there is a lot of information available for the physical domain there is still plenty of room for improvement for other domains of the quality of life. As an example, there seems to a gap in understanding of obesity in relation to the social, mental and environmental domain. This supposed gap is amplified due the limited studies available on specific themes of the quality-of-life. Therefore, the aim of this thesis will be to identify the association of obesity with the self-perceived quality of life, excluding the physical domain.

Research questions

Therefore, the research question is: *What is the association between obesity and the self-perceived quality of life of the adult inhabitant in Flevoland in the Netherlands?*

The sub questions will be the focus on the different domains previously mentioned:

What is the association between obesity and the self-perceived social domain of the quality of life on adults in Flevoland?

What is the association between obesity and the self-perceived mental domain of the quality of life on adults in in Flevoland?

What is the association between obesity and the self-perceived environmental domain of the quality of life on adults in in Flevoland?

Objective

The objective is to gain insights on obesity in relationship to the self-perceived mental status, social status and environmental status. To accomplish this objective, this thesis includes of a part comprised of theory. Secondly, the thesis will elaborate on the existing research that is been performed in the last 20 years. These sources will be the theoretical basis for this thesis. Thereafter, there will be a part of the methodological approach of this thesis. In this part the statistical methods are discussed and explained. Next to this, there will be the part on the results, this part comprises the results of the analysis that had been performed in this thesis. Thereafter, the discussion and conclusion section will analyse the results and a concise conclusion will be given. Finally, there will be some possible recommendations for future research.

2. Theoretical framework

2.1. Relevant theories

Quality of life

The concept quality of life is a central part of this thesis. Nevertheless, there are many definitions on the concept of quality of life, first established by psychologist Maslow in his hierarchy of needs. Therefore, due to the many differences in the interpretation of the quality of life, it is important to precisely describe how the quality of life is defined in this thesis. Although, many theories on the quality of life seem very similar, there are large discrepancies. For instance, many applications of the quality of life slightly changed the interpretation of the concept. As an example, in the 1970's when stress became of major interest to scientist, stress and the quality of life was interpreted as the same concept (Skevington, 2007). Thereafter, quality of life was more interpreted as the subjective perceptions of person. Moreover, Wenger and colleagues (1984) defined the quality of life as the individual perception of their functioning and wellbeing in different domains of life. The WHO used and adjusted the definition of Wenger and colleagues (1984).

The WHO describes the quality of life as:

> *"The individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment."- WHO 1998*

To conclude, the WHO interprets the complex quality of life, as a broad concept. For this thesis, the WHO concept that consists of a person's psychological state, social relationships and the salient features of their environment are used. To specify, for the reason that the main strength of the concept lies in its broad definition. In many cases, the quality of life is a measuring tool for different domains of the personal life and therefore useful in understanding of the subjective personal experience of life itself. Due to the lack of a universally agreed definition of the quality of life, the WHO decided to work with a dozen of international field

centres to define the "quality of life". As a result, this definition became leading definition since 1998 and consequently the definition used in this thesis.

2.2. Literature review

The quality of life comprises the social, mental and environmental domains. Therefore, in this chapter there will be a breakdown of all the domains. As mentioned before, the quality of life is a broad ranging concept effected by multiple factors at once. Originally, the physical health is also part of the quality of life. However, the social, mental and environmental domains are neglected compared to the physical domain. In contemporary research there is heavy emphasis on the physical domain therefore the scope of this thesis will be on the mental, social and environmental domain.

Mental domain

The mental domain is on itself a broad concept. As mentioned before, the mental domain comprises the amount of control experienced in a person's life, the feeling of a sad mood, the feeling of self-worth and the feeling of helplessness (Connell O'Cathain and Brazier, 2014).

For instance, obesity can have a detrimental effect on the mental state and is found to be negatively associated with the state of well-being. In addition, various large-scale studies describe the association between obesity and depressions (de Wit *et al.,* 2010; Luppino *et al.*, 2010; Amiri *et al.*, 2018; Heo *et al*., 2005). In some cases, the association was gender specific, meaning that only for woman people were more likely to suffer from depression while being obese. (de Wit *et al.*, 2010). To the contrast, while obesity and depressions are associated, being overweight was not found to be associated with depression (Amiri *et al*., 2018). However, these findings raise some questions. For instance, are obese people more likely to develop a depression or are depressed people more likely to develop obesity? With this in mind, a largescale longitudinal study found that obese people were 55% more likely to develop a depression compared to a normal weight group (Luppino *et al.*, 2010). Moreover, people with a depression had an 58% higher risk for becoming obese compared to the normal weight group (Luppino *et al.*, 2010). In contrast, another possibility of developing obesity can be due to the side-effects of depression medication (Wurthman & Wurthman 2017). Nevertheless, there seems to be a two-way stream of obesity and depression. Therefore, obesity and mental health issues seems to be associated with each other (Luppino *et al.* ,2010). In addition,

an underlying cause such as inflammation of the body are proposed by several studies (Luppino *et al.*, 2010; Yang *et al.*, 2016; Lu *et al.*, 2015). However, this will be outside of the scope of this thesis.

Furthermore, depression has undeniably a detrimental effect on mental health. However, also more subtle problems with mental health occur more often in people with obesity. For instance, low-self-esteem can have long term detrimental effects on your mental health. Next to this, children and adults with obesity were more likely to experience a low self-esteem and a low self-value (Griffiths, 2010; Hill, 2017; Sánchez Arenas, 2015). Moreover, children with obesity were more likely to be bullied by their peers for their high BMI level (Hill, 2017). Consequently, suffering from obesity in the teenage years can have long-term effects on mood disorders and eating disorders (Hill, 2017).

To conclude, the mental domain is studied intensively, and foremost depressions and obesity seem to be associated. Moreover, there were multiple effect of obesity on different moods and emotions. For instance, people with obesity had a lower perceived self-esteem. To keep in mind, the previous cited research is based on populations of high-income countries. Although, the Netherlands is a high-income country there can be social-cultural differences that influences the replicability of interpretations. Next to this, there is almost no similar research done in the Netherlands.

Social domain

The social domain comprises of daily social interactions and social relationships of a person (Helgeson, 2003). Relevant concepts within the social domain are social relationships, supportive networks, connectivity between individuals and loneliness.

The social domain is associated with obesity in the scientific literature. For instance, the idea that social networks influence the obesity prevalence is a recurring topic in the literature. Moreover, friendships seem to be associated with the prevalence of obesity. As an example, Cohen-Cole and Fletcher (2008) argued that obesity could be spread through social networks and could be influenced by the living environment. Although, the researchers could not rule out the possibility of person-to-person spread, since environmental influences can be the underlying cause. Furthermore, obesity within social networks resulted in an average higher chance of becoming obese (Christakis and Fowler, 2008). To illustrate this, figure 1 shows the increased risk of becoming obese for an individual based social contacts that already are suffering from obesity. Especially, friends with obesity within the social networks, results on average in an increase in the chance of becoming obese (Christakis and Fowler, 2008; Zhang et al., 2018; Valente et al., 2009). Moreover, friendships were more likely to occur when people

had the same weight status (Zhang et al., 2018; Schaefer and Simpkins, 2014; Valente et al., 2009). Likewise, Schaefer and Simpkins (2014) attributed the avoidance of friends with obesity by non-obese individuals as the main driver for friendships with the same weight status. To conclude, there is an association between being obese and having obese friends. (Christakis and Fowler, 2008; Zhang *et al*., 2018; Valente *et al*., 2009). Therefore, there seems to be association between social networks on one's weight status.

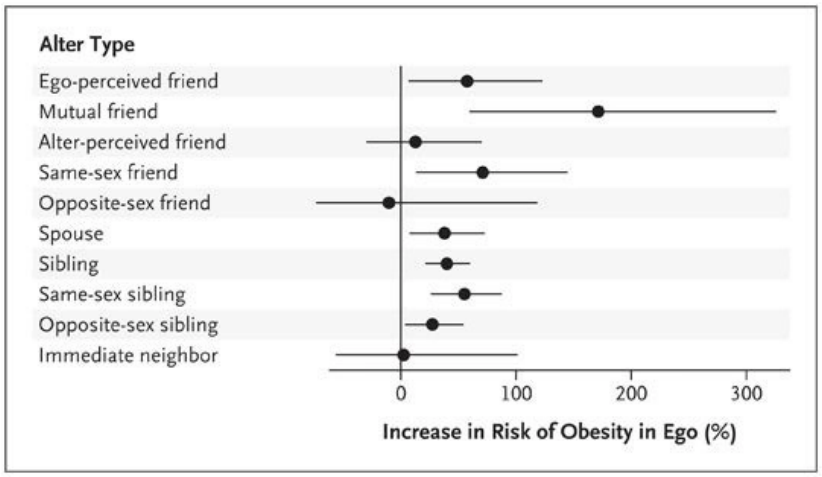

Figure 1: The increased risk of a person (ego) if becoming obese according to their relationship. (From: Christakis and Fowler 2008, p.379).

In addition, problems and disturbances within the social network could increase the prevalence of obesity (Çam and Üstüner Top, 2019; Leahey *et al.*, 2015). Moreover, people suffering from obesity were more likely to come from a dysfunctional family (Çam and Üstüner Top, 2019). Especially, poor communication was associated with a higher prevalence of obesity (Çam and Üstüner Top, 2019). Therefore, contemporary obesity prevention recommends targeting the social environment of a individuals besides targeting the individual itself (Leahey *et al.*, 2015).

Furthermore, normative beliefs and social contacts are associated with the weight status of a person (Leahey et al., 2011). In addition, close friends and parental support are important as a support network for adolescents (Herzer *et al.*, 2011). However, Herzer and colleagues (2011) concluded that adolescents themselves stated that classmates were not seen as strong social networks. In contrast, the classmates had a negative influence on the quality of life of persons suffering from obesity (Herzer *et al.*, 2011). Furthermore, Leahey and colleagues (2015) found no association between the BMI and social norms surrounding obesity. However, in this research there was an association between unhealthy eating norms and obesity treatment outcomes (Leahey et al., 2015). In addition, Hajek and König (2019), describe the relation

between obesity and loneliness. To be more specific, for men there is a significant relationship between loneliness and obesity (Hajek and König, 2019).

Especially, supportive social networks can be beneficial for reducing the BMI (Hajek and König, 2019). However, people with obesity often become friends with other people that suffer from obesity. This can be explained, by the social selection process of individuals that suffer from obesity. Consequently, obesity is clustered in social networks. Hence, the social network effect will reinforce obesity, making it more difficult to change, leading to a vicious cycle.

To conclude, the social domain also seemed to be associated with obesity. Friendships and the social environment are associated with obesity according to the research. For instance, a high prevalence of obesity in the social environment increased the risk of a person becoming obese. Moreover, strong support networks can improve intervention on obesity prevalence. Therefore, people with a strong social network are more likely to reverse obesity.

The environmental domain

Lastly, the environmental domain is defined as the immediate environmental situation of an individual. This includes the financial situation of a person and the individual living environment (Preedy and Watson, 2010). Therefore, in this thesis the environment is interpreted as the immediate surroundings of a person suffering from obesity.

To start off, literature shows an association on the immediate surroundings of a person and obesity in different ways. For example, a walkable physical neighbourhood has been linked to increased walking distances and thus a reduction in obesity prevalence in the population (Lee *et al.*, 2015; Creatore *et al.*, 2016; Barbosa *et al.*, 2019). It was hypostasized by the authors, that neighbourhood park and shopping centra could be a factor for the increase in walking. Besides the availability of unhealthy food sources such as fast-food restaurant and the lack of healthy alternatives, walkability thus is associated with obesity prevalence.

Moreover, obesity can also have adverse effects to the immediate environment. As an example, a neighbourhood with an unfriendly walkable environment had a higher prevalence of obesity (Creatore *et al.*, 2016; Barbosa *et al.*, 2019). This research was controlled for social economic status because people with a low social economic status often dwell in neighbourhoods with low ranked walkability (Creatore *et al.*, 2016). The authors suggested that intervention methods should be geared towards the decrease in obesity and can likewise focus on the walkability of neighbourhoods (Lee *et al.*,

2015). To sum up, many of the research regarding walkability and obesity was conducted in high incomes countries and much of the contemporary research showed an association between walkability of neighbourhoods and obesity (Barbosa *et al*., 2019; Creatore *et al*., 2016; Lee *et al*., 2015). Although, more variables can be the underlying cause of the increases in obesity prevalence in these neighbourhoods. Especially, the social economic status is often a control variable in research. Moreover, obesity intervention methods can benefit from the development in liveable conditions. For example, the obesity can see a reduction in prevalence due to the availability of nearby park areas in urban districts, more visible greenspaces and recreational facilities (Suglia *et al.*, 2016).

Besides, the literal living environment such as neighbourhoods, the environmental domain also consists of personal environments such as work. For instance, weight discrimination can happen in multiple aspects of daily life. As an example, obesity can have adverse effects on the work-related environment. Although, this disadvantageous characteristic of obesity is caused by weight discrimination. Furthermore, weight discrimination can also result in adverse effects on job opportunities (*Flint et al*., 2016). As an example, obese people are more likely to be judged in a negative way on their leadership's skills and their overall successes in work (*Flint et al*., 2016). Consequently, obesity can have negative outcomes for job recruitment and additional promotions at work. However, weight discrimination at work is more frequently associated with woman (Latner *et al.*,2014). Nevertheless, the effect of weight discrimination may be due the 'self-discrimination' (Latner *et al.*,2014). Above all, people that experienced weight discrimination were more likely to become obese (Sutin and Terracciano, 2013). To sum up, weight discrimination can have negative effects on job opportunities while individuals that experience weight discrimination also have an increased risk of becoming obese. Hence, the effects of weight discrimination can establish a downward spiral for the individual.

To conclude, obesity and the environmental domains are associated according to most of the literature. Especially, the literal environment is extensively studied and well established in the literature. However, the immediate surroundings such as work also seemed to be associated with obesity. Although, this effect could be caused by weight discrimination or self-discrimination.

2.3. Control variables

There are some variables that will influence obesity while also influencing the quality of life. First, the social-economic status is often controlled for in these types of research. The social-economic status of an individual has influence on the quality of life while also having influence on the obesity prevalence (Minet Kinge and Morris, 2010). Therefore, the social-economic status must be controlled for.

Secondly, gender is added as a control variable for its relationship with obesity. As an example, the prevalence of obesity is greater for woman compared to men (Garawi *et al.* 2014). Although, some of these gender specific differences are attributed trough the biological difference between the genders, it is also expected that social-cultural discrepancies can play a role (Garawari *et al.* 2014). Therefore, it is expected that the gender can influence obesity and as a result should be controlled for.

In addition, age is also influencing the quality of life while also having influence on obesity. As an example, Rothman (2008) critiqued the BMI scale due to its variability with age. Rothman (2008) and colleagues stated that older age impacts the body composition were muscle decreases while the amount of fat increases on average. Likewise, age is expected to increase the amount of fat mass in older ages. Next to this, age can have impact on the quality of life (Netuveli and Blane, 2008). Although, the influence of age on the quality of life is arguably caused by an increase in diseases in the older age groups. However, it has some influence on both and is therefore controlled for.

Thereafter, smoking is almost always controlled for in these types of research. For instance, smoking has found to be to harm to the body in various ways from severe lung problems to heart and vascular diseases and many more serious harmful diseases. As an result, these negative health outcomes can have a negative impact on the quality of life (Goldenberg *et al.* 2014). Therefore, smoking will be controlled for.

Lastly, the education level is in similar research controlled for. The educational level is influencing the obesity prevalence rates and the educational level is suspected to have some influence on the quality of life (Mielck *et al.,* 2012). Nevertheless, the influence of social-economic status is suspected to be the underlying cause (Mielck *et al.,* 2012). However, the educational level is controlled for due to its influence on both the obesity rates and the quality of life.

2.4. Conceptual model

In the conceptual model different concepts are related to each other. This is visualized in figure 2. There is a proposed relationship between obesity and the different domains of the quality of life. Therefore, obesity is expected to be associated with the mental domain, the social domain, and the environmental domain in the conceptual model. Lastly, the control variables are influencing the dependent and independent variable. Consequently, the social-economic status, gender, age smoking habits and educational level are included in the conceptual model.

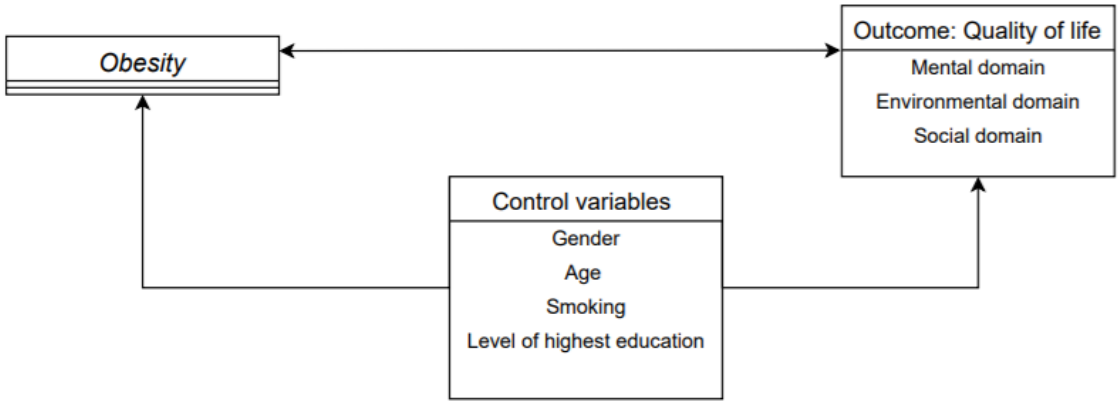

Figure 2: The conceptual model used for this thesis.

2.5. Hypothesizes

The mental domain

Arguably, the literature already connected obesity and some mental health related issues. In addition, the literature thoroughly discusses the relationship between obesity and depression. Although, depression is part of the mental domain there are many aspects related to the mental domain. As an example, the self-esteem is also already linked to obesity. Therefore, in this thesis there is expected that many subdivisions of mental domain are interlinked and therefore obesity is expected to indeed to be negatively associated with obesity. Although, the literature shows some evidence of the relation between obesity and mental domain, being overweight did not. Therefore, there is no expected negative relationship between obesity and the mental domain compared to the normal weight group.

The social domain

The social domain itself is a broad concept where a lot of social related topics can be related to the social domain. For instance, friendship and the social environment are discussed in pieces of literature that are presented in chapter 2. Next to this, intervention methods that fixated on the immediate surroundings of the social environment of an individual shows improved results in decreasing obesity prevalence, further supporting the supposed relationship between the social domain and obesity. Next to this, a higher prevalence of obesity in the immediate social surroundings were predictors of a higher obesity prevalence in several studies. Therefore, in this thesis due to the intertwined nature of social behaviour and obesity, there is expected that both are associated. Meaning, that negative outcomes for segments of the social domain are expected to be related to obesity.

The environmental domain

The existence of a relationship between one's immediate surroundings and behaviour is often the focus of research. Although, there is some evidence of the relationship between obesity and some aspect of the environmental domain such as the immediate living situation, living surroundings such as walkability of the living neighbourhood and the work environment. However, there is still a large gap in the understanding of obesity and the environmental domain. Nevertheless, based on the existing literature this thesis expects that negative outcomes in some segments of the environmental domain are indeed associated with the prevalence of obesity.

3. **Research methods**

3.1 Methodological approach

As mentioned in the preface, this thesis uses this secondary data from the municipal health service of Flevoland (GGD Flevoland), namely: the health monitor for adults (age 18 and above) of 2016 in Flevoland. The GGD Flevoland uses this data as a measurement to identify the health and lifestyle status of the inhabitants of Flevoland using mostly Likert-scale questionnaire questions. Furthermore, the questionnaire is conducted every four years with a random sample, therefore the data is cross-sectional. In the province of Flevoland 5220 new participants participated in the health monitor in 2016. The GGD selects one out of ten inhabitants based on the representation of the total population. Therefore, inhabitants that have not been selected are not eligible to participate in the health monitor. Although, there were 5220 respondents on a total population of ≈ 405.000 people and the response rate was 12,9%, the sample was not representative for the normal distribution of the population of Flevoland. For example, women are usually more likely to participate in questionnaires. To tackle this issue, the GGD uses weighting factors, which are used to make the sample more representative for the whole population. In our example, men would be underrepresented because the normal male population of Flevoland is 50,03% and therefore can be counted with a different factor to guarantee the almost even split between men and woman as in the normal distribution of population in Flevoland.

Although, the GGD Flevoland was responsible for the data collection process and for conducting the research, it was a co-operation between the National institute of public health (RIVM), the central bureau of statistics (CBS) and the national collaboration of municipal health services (GGD GHOR).

To ensure privacy and data safety, the GGD has a strict application selection for using the data that has been used in this thesis. In this manner the ethical commission can rule if the application is sufficient to use the data. Furthermore, the commission also has some financial cost related to the application. In addition, the other requirement is that the usage of the data must serve a public goal. Next to this, within the GGD this data is used for research to ensure an improvement in quality on public health related projects. Lastly, the data can only be used on site or through a remote access server (De gezondheidsmonitors, 2021).

The GGD uses this data to gain an overall insight into different themes of health and lifestyle of the population of Flevoland. These different themes include quality of life related topics, such as loneliness, feeling of control, financial situation, connectivity, feeling of sad mood, living conditions low self-worth helplessness and work conditions. In addition, the participant answered questions on their physical health, for example on weight and length and thus BMI (De gezondheidsmonitors, 2021).

3.2 Variables

The sample size is 5220 adults (18 or older) from the province of Flevoland and the response rate is 12,9%.

Independent variable

The independent variable used in thesis will be based on the body mass index classification (BMI). Especially, the obesity weight group compared to the other weight classes is of special interest. Moreover, obesity is defined as having a body mass index above >30 kg^2/m^2(WHO, 2020). As mentioned in previous chapters, the respondents filled in their weight and height and therefore data on the BMI is available. Next to this, there are different weight classes used in existing literature. Hence, four or sometimes even five categories used for the BMI scale. Nevertheless, the national health, lung and blood institute uses four categories based on the underweight group, the normal weight group, the overweight group and the obese weight group (Calculate Your BMI - Standard BMI Calculator, 2021). Next to this, many national health institutes use the simpler four category identification. Therefore, in this thesis the standard four weight classes will be used, namely the groups the "underweight goup" the "normal weight group", the "overweight group" and the "Obese weight group".

The classification of BMI (Calculate Your BMI - Standard BMI Calculator, 2021): = $Weight/(Length\ in\ M * Length\ in\ M)$

< 18,5 kg/m^2	= Underweight
≥ 18,5 kg/m^2 < 25kg/m^2	= Normal weight
≥ 25 kg/m^2 < 30kg/m^2	= Overweight
≥ 30 kg/m^2	= Obese

Further elaborated, in this thesis the BMI weight classes are used as the independent variable because a high BMI is associated with adverse health effects on the physical level, social level, mental level and environmental level. Moreover, the BMI scale is used for identifying people with high levels of fat mass. However, the use of the BMI is often criticized due to the limited scope of the measurement (Stefan, 2020; Chung-Hong Tsai *et al*., 2012; Ashwell and Gibson, 2016; Nuttall, 2015). Furthermore, there is a difference in the type of fat, especially fat around the organs so called visceral fat has been linked to adverse physical and mental health effects and is therefore considered more dangerous (Stefan, 2020). However, the BMI scale does not differentiate between the type of fat deposits. Therefore, different

measurements are proposed to substitute for the BMI scale, such as the calf-circumferences and the waist-to-height ratio (Chung-Hong Tsai *et al*., 2012; Ashwell and Gibson, 2016). Tsai and colleagues (2012) and Ashwell and Gibson (2016) indicated that measurements such as waist-to-height ratio, the mid-arm circumferences and calf circumferences were better predictors of mortality and early health risks than BMI. Moreover, the BMI does not differentiate between different body compositions. For instance, the body composition of individuals changes with age, with a decreasing muscle mass and increase in fat mass the overall weight stays the same while gaining more bodyfat (Rothman, 2008). Nevertheless, this will be not accounted for in the in the analysis separately, mainly due the fact that age is already separately accounted for.

The BMI scale can be negatively skewed towards people with large amounts of muscle and sturdy builds (Rothman, 2008; Nuttall, 2015). As a result, people with a large amount of muscle mass often are classified as overweight or obese, according to the BMI scale. Whilst, having less negative health outcomes and societal conviction than actual obesity due to having a skewed BMI index level.

Nevertheless, the BMI is still widely used in health research because it is easy to use and easy to calculate (Nuttall, 2015). For example, the BMI-scale only requires information on total bodyweight and total body length both available in this dataset. Moreover, the BMI index level is strongly correlated with other predictors of obesity and fatness (Obesity prevention Harvard, 2020). Furthermore, for the average non-athlete, like most of the people in the world, the BMI index is good indicator of fat mass (Obesity prevention Harvard, 2020). Although, other measurements such as the hip-to-waist ratio and the calf-circumference are often better predictors excessive fat mass, health and societal conviction, it requires detailed information often not known to an individual when filling in a questionnaire and thus not present in this dataset. To conclude, in this thesis the BMI measurement is used, due the widespread use in research, the widespread use in clinical health and above all, the lack of alternative measurements of large groups of individuals.

The main aim of thesis is identifying the association of obesity and the self-perceived quality of life. Therefore, there should be a differentiation between weight groups.

Dependent variable

As mentioned in previous chapters, the quality of life will be sub-divided in three different domains. Moreover, these three domains have their own subdivision. Each of these subdivisions has questions related to the topic in the questionnaire. Therefore, on all these topics there are a total of 13 questions related to these domains. The absolute number of questions for each domain requires a

simplification in the dependent variable. For instance, the factor analysis will combine multiple variables as one dependent variable for each domain in the multiple linear regression. As a result, the factor analysis simplifies and reduces the number of variables to three dependent variables.

Factor analysis social domain

The factor analysis on the social domain will comprise five different questions that will make up the dependent variable. The questions are about the subjects such as: "Feeling of emptiness", "Missing a good friend", "Feeling abandoned", "The possibility to discuss personal problems" and "The availability of sufficient sociability". Furthermore, all these questions are ordinal and can be answered with "yes", "sort of" and "no". The subdivisions and related questions of the social domain are included/enclosed in figure 5 on page 46 and 47.

Factor analysis Mental domain

The factor analysis for the mental domain comprises of five questions. The different subdivisions are divided according to the topics: "Feeling of control", "Feeling of a depressive mood", "Low self-worth", "Helplessness" and "Having the possibilities to change life". Some questions did have the possibility to answer ranging from always to never while the other questions have a possible range between totally agree and do not agree at all, a total of five options. The subdivisions and related questions of the mental domain are visualized in figure 6 on page 46 and 47.

Factor analysis Environmental domain

Lastly, the factor analysis for the environmental domain comprises of three questions. into three divisions. These subdivisions are: "Financial situation", "Living conditions" and "Work conditions". The question on the possibility to pay the bills is ordinal data and ranges from "not at all" to "Yes a lot". Nevertheless, the other two questions are numeric data, therefore considered ratio data. The subdivisions and related questions of the environmental domain are in visualized in figure 7 on page 46 and 47.

To conclude, to test the main hypothesis of this thesis: "*What is the association between obesity and the self-perceived quality of life of the adult inhabitant in Flevoland in the Netherlands? ",* there will be three separate analyses on the three different domains of the

quality of life. For instance, the hypothesis on the mental domain "*What is the association between obesity and the self-perceived mental domain of the quality of life on adults in in Flevoland"*, will be tested with the help of five Likert-scale questions that will be combined with the help of a factor analysis.

Next to this, the hypothesis of the social domain "*What is the association between obesity and the self-perceived social domain of the quality of life on adults in Flevoland?* ,again will be tested with the help of five Likert-scale questions that will be combined with the help of an factor analysis.

Lastly, the hypothesis of the environmental domain "*What is the association between obesity and the self-perceived environmental domain of the quality of life on adults in in Flevoland?",* will be tested with the help of a factor analysis with one "yes or no" questions and two scale questions where the participant had to fill in the total amount of minutes spend doing a task.

Control variables

Gender

In the questionnaire one of the questions is "What is your gender" Therefore, the dataset has information on the type of gender a person identifies with. Therefore, the two options are recoded as 1= man and 2= woman.

Age

This dataset consists of information on the birthdate of the person. Therefore, the age of an individual will be used as a control variable.

Smoking

There are two questions that contain information on the smoking habits. Both variables are binary and are recoded as 1= yes and 0= no. The first variable is: "do you smoke" and the second variable is: "did you used to smoke". The variable "do you smoke" is present tense and more useful than information of an individual that for instance used to smoke 30 years ago, therefore the variable "do you smoke" is used as control variable.

Level of highest education (Social economic status proxy)

The dataset consists of data on the level of education of the individual that participated in the questionnaire. As mentioned in a previous chapter, one of the control variables of the thesis would be the social-economic status. Unfortunately, there is no data available for income or income related questions. Therefore, with the lack of data on the social economic status the level of highest education can be used as a proxy for social economic status (Broer *et al.*, 2019). Although, the strong correlation between the two variables there is a more nuanced difference between the two variables. Nonetheless, in this case it is the best alternative.

This data consists of 8 levels of education. However, this will be recoded in three educational levels 1= low level of education, 2= medium level of education and 3= high level of education. Moreover, the low level of education consists of "No education" "only primary school" and the "vocational education". The medium level of education consists of "general secondary education" and the "secondary vocational education". Furthermore, the higher education consists of the "Higher general education" the" Higher vocational education" and the "Scientific education".

3.3 Plan of analysis

To start off, all the analysis had been performed with the help of SPSS 25 in a secure server from the GGD Flevoland itself. Most of the data was unusable directly because many small changes have to be done to "clean" the data and therefore some cleaning of the data had been performed to use the data. For instance, only the usable cases had been selected while the unusable cases had been removed. Next to this, without going to much in depth on specific steps, there had been many small adjustments to categories and labels to make the data more usable.

Steps for the analyses

Thereafter, it is important to determine which statistical test best fits the data and hypothesis. As a reminder, the questions are: "*What is the association between obesity and the self-perceived social domain of the quality of life on adults in Flevoland", "What is the association between obesity and the self-perceived mental domain of the quality of life on adults in in Flevoland?", "What is the association between obesity and the self-perceived environmental domain of the quality of life on adults in in Flevoland?".* With these questions

and aims in mind, the multiple linear regression best fits this thesis. To clarify, the multiple linear regression is simple to use and consist of valuable information on sign and significance, both needed to support or to oppose the hypothesis. Especially, based on the questions and the combined factor analysis as dependent variable, the multiple linear regression gives the best outcome. Furthermore, the main objective is to identify the association of obesity on the quality of life. Therefore, the quality of life should be the dependent variable and the weight status the independent variable. To be more specific, some adjustments are needed to make all the combined variables that will be used to produce the factor analyses, positive or negative, thus the same direction. In short, some of the variables (questions) have been reversed to make them all combinable and comparable.

Before the statistical tests are carried out, a visual overview of the descriptive statistics is given. The variables shown are dependent on the availability of information on the weight adjusted variables form the GGD. Consequently, there is less information available on the descriptive data of the questions used in the thesis. As mentioned before, the compliance of using the same weight adjusted variables limits the insights on the separate questions. Thereafter, the factor analysis had been performed and there will be three factor analyses to determine the dependent variable for the social, environmental and mental domains. The factor analysis and scree plot will be used to check the number of components of each dependent variable. According to the scree plots, there is one component for the Mental and social domain, while the environmental domain shows two components in the original test. However, the choice has been made to select one of the components with the most valuable information. To explain, this has been done because two of the variables showed a discrepancy in usability and with further inspection were not usable in the factor analysis at all. To specify, the questions did not really fit the criteria of the environmental domain according to the literature. Therefore, the decision has been made to remove them.

Thereafter, the next step is to add the control variables to the multiple linear regression. However, besides data on the age of the respondent, the other data types are not directly usable as control variables for the multiple linear regression in its original form. Therefore, the original data will be adjusted with the help of dummy variables. To be more specific, the original data on the educational level had at least 8 outcomes, this has been reduced by combination of some of the outcomes to only four categories.

Lastly, the multiple linear regression will be performed in five stages after the above steps. In the first stage, only the dependent variable and the independent variable will be added to the model to see the effects of only the dependent variable and the independent variables

without the control variables. Next to this, control variables will be added in separate stages till all control variables have been added. To clarify, by using this method there will be more information on how the control variables influence the results separately. Moreover, this could contain valuable information for the interpretation of the results.

To sum up, the analysis of this thesis will comprise of three multiples linear regressions based on varying questions of the health monitor of Flevoland. The three variables that will be used in these analyses are the based on the factor analyses of the social domain, mental domain and environmental domains.

4. Results

The focus of this chapter will be the presentation of the descriptive data. Thereafter, there will be a concise evaluation of the factor analysis. Thirdly, the correlation results for the variables used in the three factor analyses will be visualised. Lastly, the results of the three multiple linear regressions will be presented.

4.1. Descriptive results

Table 1 shows the descriptive results of the population of Flevoland. The largest age group used in this thesis is the age group 35-64 (56%). The distribution in the weight group shows that more than half of the population is overweight or obese. Moreover, 15% of all individuals in Flevoland are obese while only 2% of the entire population is underweight. In addition, the gender of all individuals is evenly split in the province of Flevoland and the smoking group consists of 18% of the population. Next to this, the educational level of the population is quite diversified and around 30% of the population is low educated, comparable to the high educated group. Secondly, the largest group has a medium level of education (42%).

Table 1. Descriptive statistics Flevoland population

	%
Age groups	
19-34	27
35-64	56
65-79	15
80+	3
Weight groups	
Underweight	2
Normal weight	46
Overweight	38
Obese	15
Gender	
Male	50
Female	50
Smoking	
Yes	18
No	82
Educational level	
No secondary education	5
Low educational level	25
Medium educational level	42
High educational level	29

Table 1: The descriptive statistics according to the GGD Flevoland.

4.2. Factor analysis

To specify, the three factor analyses had been performed to combine multiple separate questions to one usable dependent variable. The factor analyses for the social and mental domain had only one component, according to the scree plot (p.49 & p.54). Meaning, that the 5 questions of the questionnaire were able to combine as one variable. However, for the environmental domain there were two components (p. 58), meaning that there would have been two variables. Nevertheless, the underlying cause of the two components were mainly due to the non-specific questions related to the environmental domain. Compared, to the mental and social domain, the environmental domain had less usable data sources to construct a decent variable. Therefore, only one group of the most usable components had been selected as dependent variable, based on the scree-plot and the in-depth analysis of the environmental domain. Nevertheless, the environmental domain related questions that form the dependent variable are less viable as segments according to the literature. As a result, the produced environmental domain variable is only partly applicable compared to the most optimal data inputs such as walkability, working conditions and living conditions. However, the most optimal data inputs are unfortunately not available in the dataset.

4.3. Model fit

For all three multiple linear regressions, model 1 to model 5 somewhat improve the R square and adjusted R square. Based on the large number of variables, including control variables, only the adjusted R square will be used to analyse the explained variance. As an example, the adjusted R square improves in the mental domain, the first model has an explained variance of 0,8% (adjusted R2=0.008) and the fifth model has an explained variance of 5,3% (adjusted R2=0.053). This is also true for the environmental domain, model 1 has an explained variance of 0,7% (R2=0,007) and model 5 has an explained variance of 15,4% (R2=0.154) and the social domain model 1 has an explained variance of 0,5% (R2=0.005) and model 5 has an explained variance of 2,8% (R2=0.028).

Nevertheless, the R square values remain relatively low for all three domains. However, this can imply that there are many more variables that comprise of the explained variance of the factor scores of the different domains. The independent variables are influenced by many other variables based on other research. Therefore, it is expected that the mental domain, social domain and environmental domain can only be explained by a small margin of the variance by

body mass index weight groups and the control variables. However, a smaller r square is expected within research on these types of research on broad concepts such as the social, mental and environmental domains.

4.4. Results multiple linear regressions analyses.

Table 3, 5 and 7, show three separate multiple linear regressions used for the analyses in this thesis. All these multiple linear regressions have 5 models. The starting model for all the multiple linear regressions only has the factor for mental domain, the factor for the environmental domain, and the factor for social domain. Next to this, the four different weight groups underweight, normal weight overweight and Obese are added to the first models.

Thereafter, each model will include a new control variable to control for important variables. In result, each model will be slightly different with an additional control variable. Ultimately, the fifth model is thus the full model with all additions added.

*The mental domain **(Table 3)***

The first model is the model without control variables and thus only comprises of the dependent variable the factor analysis for the Mental domain and the four weight classes. This entire model is statistically significant (0.046; $p<0.05$) with a constant ($\beta=0.044$), the weight group underweight (0.000; $p<0.05$) and the weight group obesity (0.000; $p<0.05$) are significant. This means, being underweight ($\beta=-0.330$) and being obese ($\beta=-0.228$) both are expected to be negatively associated with the dependent variable factor of the mental domain with a sign of -0,330 and -0,228, respectively. The other weight group being overweight is not significant and thus is not expected to be associated with the factor mental domain. Therefore, the hypothesis that obesity is associated with the mental domain, can be supported by model 1.

In the next step in model 2, the variable age is added to the model. Moreover, the control variable age is also not significant. Therefore, it is not expected that age is associated with an increase of quality of life on the mental domain.

However, in model 3 the gender is added to the model. The control variable male is significant (0.000; $p<0.05$) with a probability of $\beta=0.213$. Meaning, that the male gender is expected to be positively associated with the mental domain of quality of life compared to the female gender with a positive sign of 0.213.

In the next step of the model, the control variable smoking is added to the model. Moreover, the control variable smoking is significant (0.000; $p<0.05$) with (β=-0.238), the negative β can be interpreted as a reduction in mental domain factor score when someone smokes cigarettes with a negative sign of -0.275 compared to someone that does not smoke.

Lastly, in the last model the control variable educational level is added to the model. This resulted in significant results for the high level of education and medium level of education (0.000; $p<0.05$), in comparison to the low educational level and the no educational level. Moreover, the high level of education is expected to positively influence the factor score of the mental domain with a positive sign of 0.186 while the medium level of education is expected to positively influence the factor score of the mental domain by a positive sign of 0.190. Moreover, this time the entire model is significant and therefore the hypothesis that obesity is associated with the mental domain, holds true according to model 5.

Table 3. Multiple linear regression results for the Mental domain, Unstandardized coefficients.

	Model 1				Model 5			
	Adjusted R^2 =0,008				Adjusted R^2 =0,053			
	β	Std. Error	p		β	Std. Error	p	
(Constant)	0,044	0,022	0,046	*	-0,426	0,091	0,000	*
Weight groups								
Underweight	-0,330	0,124	0,008	*	-0,222	0,121	0,067	
Normal weight	Ref.				Ref.			
Overweight	-0,002	0,032	0,951		-0,021	0,032	0,504	
Obesity	-0,228	0,041	0,000	*	-0,197	0,041	0,000	*
Age					0,027	0,001	0,294	
Gender								
Male					0,213	0,029	0,000	*
Female					Ref.			
Smoking								
Yes					-0,238	0,041	0,000	*
No					Ref.			
Educational level								
No education					Ref.			
Low educational level					0,127	0,077	0,099	
Medium educational level					0,190	0,037	0,000	*
High educational level					0,186	0,026	0,000	*

Dependent Variable: Factor of the Mental domain
* = Significant at the p level of <0.05
Ref.= Reference catagory

Table 4. Correlations for the Mental domain.

	Factor mental domain	Underweight	Overweight	Obese	Age	Male	Smoking	Low educational level	Medium educational level	High educational level
Factor mental domain	1,000									
Underweight	**-0,034**	1,000								
Overweight	**0,033**	**-0,094**	1,000							
Obese	**-0,083**	**-0,053**	**-0,357**	1,000						
Age	-0,013	**-0,045**	**0,094**	**0,057**	1,000					
Male	**0,117**	**-0,078**	**0,128**	-0,022	**0,083**	1,000				
Smoking	**-0,084**	**0,037**	-0,019	**-0,056**	**-0,112**	**0,043**	1,000			
Low educational level	**-0,130**	-0,005	0,023	**0,095**	**0,274**	**-0,059**	0,010	1,000		
Medium educational level	**0,027**	0,016	0,009	-0,007	**-0,088**	0,004	0,029	**-0,543**	1,000	
High educational level	**0,130**	-0,015	-0,021	**-0,090**	**-0,171**	**0,057**	**-0,052**	**-0,298**	**-0,552**	1,000

The text in bold is significant with a p value of <0.05

*The social domain **(Table 5)***

The first model is the model without control variables and thus only comprises of the dependent variable the factor analysis for the social domain and the four weight classes. This entire model is significant (0.030; $p<0.05$) with a constant ($\beta=0.048$), the weight group obesity (0.000; $p<0.05$) is significant while the other weight groups are not significant. This means, being obese ($\beta=-0.210$) is to be expected to influence the dependent variable factor of the social domain with negative sign of -0,210. The other weight groups are not significant and thus are not expected to be associated with the factor social domain. Therefore, the hypothesis that obesity is negatively associated with the social domain can be supported by model 1.

In the next step in model 2, the variable age is added to the model. This influences the ($\beta=-0.001$). Meaning, that every year of age negatively decreases the quality of life for the social domain with a negative sign of -0.001 per year. However, the control variable age is also not significant. Therefore, is not expected that age negatively influences the quality of life for the social domain.

Thereafter, in model 3 the gender is added to the model. This resulted in almost no change in the constant of the model. The control variable male is significant (0.000; $p<0.05$) with a probability of $\beta=0.106$. To clarify, this means that being a male had a positive effect on the quality of life for the social domain compared to being a female, with a positive sign of 0.106.

In addition, in the next step of the model, the control variable smoking is added to the model. This resulted in almost no change in the constant of the model. Moreover, the new control variable smoking is significant (0.000; $p<0.05$) with ($\beta=-0.255$), the negative β can be interpreted as a reduction in mental domain factor score when someone smokes cigarettes with as negative sign of -0.255, meaning that smoking cigarettes had a negative effect on the quality of life for the social domain.

However, in the last model the control variable educational level is added to the model. This resulted in significant results for the high level of education and medium level of education (0.000; $p<0.05$) and for the low educational level (0.001; $p<0.05$) in comparison the no educational level. Moreover, the high level of education is expected to positively influence the factor score of the social domain by a positive sign of 0.187 while the medium level of education is expected to positively influence the factor score of the social domain by a positive sign of 0.224. Next to this, the low educational level positively influences the factor score of the social domain with a positive sign of 0.320. Moreover, the entire model is significant and therefore the hypothesis that obesity is associated with the social domain, holds true according to model 5.

Table 5. Multiple linear regression results for the Social domain, Unstandardized coefficients.

	Model 1				Model 5			
	Adjusted R^2 =0,005				Adjusted R^2 =0,028			
	β	Std. Error	p		β	Std. Error	p	
(Constant)	0,048	0,022	0,030	*	-0,356	0,106	0,001	*
Weight groups								
Underweight	-0,132	0,129	0,305		-0,075	0,127	0,558	
Normal weight	Ref.				Ref.			
Overweight	-0,028	0,032	0,384		-0,039	0,032	0,230	
Obesity	-0,210	0,042	0,000	*	-0,195	0,042	0,000	*
Age					-0,001	0,001	0,457	
Gender								
Male					0,106	0,029	0,000	*
Female					Ref.			
Smoking								
Yes					-0,255	0,042	0,000	*
No					Ref.			
Educational level								
No education					Ref.			
Low educational level					0,320	0,093	0,001	*
Medium educational level					0,224	0,045	0,000	*
High educational level					0,187	0,031	0,000	*

Dependent Variable: Factor of the Social domain
* = Significant at the p level of <0.05
Ref.= Reference category

Table 6. Correlations for the Social domain.

	Factor Social domain	Underweight	Overweight	Obese	Age	Male	Smoking	Low educational level	Medium educational level	High educational level
Factor Social domain	1									
Underweight	-0,01	1								
Overweight	0,016	**-0,091**	1							
Obese	**-0,073**	**-0,052**	**-0,357**	1						
Age	**-0,028**	**-0,04**	**0,091**	**0,06**	1					
Male	**0,055**	**-0,073**	**0,131**	-0,019	**0,083**	1				
Smoking	**-0,086**	**0,033**	-0,017	**-0,055**	**-0,113**	**0,044**	1			
Low educational level	**-0,076**	-0,009	0,017	**0,094**	**0,274**	**-0,056**	0,009	1		
Medium educational level	0,013	0,016	0,012	-0,003	**-0,091**	0,007	**0,033**	**-0,551**	1	
High educational level	**0,088**	-0,012	-0,019	**-0,092**	**-0,173**	**0,055**	**-0,052**	**-0,3**	**-0,569**	1

The text in bold is significant with a p value of <0.0

*The environmental domain **(Table 7)***

The first model is the model without control variables and thus only comprises of the dependent variable the factor analysis for the social domain and the four weight classes. This entire model is significant (0.030; $p<0.05$) with a constant ($\beta=0.048$), the weight group obesity (0.000; $p<0.05$) is significant while the other weight groups are not significant. This means, being obese ($\beta=-0.238$) is to be expected to be negatively associated with dependent variable factor of the social domain with a negative sign of -0,238. The other weight groups are not significant and thus are not expected to influence the factor social domain. Therefore, the hypothesis that obesity is associated with the social domain can be supported by model 1.

In the next step in model 2, the variable age is added to the model. This influences the entire model and increases the constant ($\beta=0.025$) while remaining significant. Meaning, that every year of age is positively associated with the environmental domain with a positive sign of 0.025 per year.

Next to this, in model 3 the gender is added to the model. The control variable male is significant (0.000; $p<0.05$) with a probability of $\beta=0.158$. Meaning, that the male gender is expected to be negatively associated compared to woman with a negative sign of -0.158.

In the next step of the model, the control variable smoking is added to the model. Moreover, the control variable smoking is significant (0.015; $p<0.05$) with ($\beta=0.107$), the positive β can be interpreted as an improvement in the factor score mental domain when someone smokes cigarettes with a positive sign of 0.107.

In the last step, the last the control variable educational level is added to the model. This did not result significant results for the high level of education and medium level of education and for the low educational level in comparison the no educational level. Nevertheless, the entire model is significant (0.000; $p<0.05$) with a probability of $\beta=1.319$ and the hypothesis that obesity is associated with the environmental domain, holds true according to the full model with all control variables included.

Table 7. Multiple linear regression results for the Environmental domain, Unstandardized coefficients.

	Model 1				Model 5			
	Adjusted R^2 =0,007				Adjusted R^2 =0,154			
	β	Std. Error	p		β	Std. Error	p	
(Constant)	-0,088	0,023	0,000	*	-1,319	0,126	0,000	*
Weight groups								
Underweight	-0,041	0,130	0,755		-0,025	0,120	0,836	
Normal weight	Ref.				Ref.			
Overweight	0,126	0,034	0,000	*	0,045	0,032	0,154	
Obesity	0,238	0,044	0,000	*	0,150	0,041	0,000	*
Age					0,025	0,001	0,000	*
Gender								
Male					-0,158	0,029	0,000	*
Female					Ref.			
Smoking								
Yes					0,107	0,040	0,008	*
No					Ref.			
Educational level								
No education					Ref.			
Low educational level					-0,050	0,115	0,663	
Medium educational level					-0,060	0,056	0,290	
High educational level					0,007	0,038	0,864	

Dependent Variable: Factor of the Environmental domain
* = Significant at the p level of <0.05
Ref.= Reference category

Table 8. Correlations for the Environmental domain.

	Factor Environmental Domain	Underweight	Overweight	Obese	Age	Male	Smoking	Low educational level	Medium educational level	High educational level
Factor Environmental Domain	1									
Underweight	-0,015	1								
Overweight	**0,03**	**-0,096**	1							
Obese	**0,067**	**-0,054**	**-0,358**	1						
Age	**0,379**	**-0,036**	**0,104**	**0,053**	1					
Male	**-0,035**	**-0,077**	**0,136**	**-0,025**	**0,102**	1				
Smoking	-0,009	**0,039**	-0,023	**-0,053**	**-0,098**	0,032	1			
Low educational level	**0,125**	0,005	0,02	**0,099**	**0,27**	**-0,052**	0,01	1		
Medium educational level	**-0,086**	0,009	0,007	-0,013	**-0,085**	0,005	0,036	**-0,544**	1	
High educational level	**-0,026**	-0,019	-0,017	**-0,091**	**-0,169**	**0,052**	**-0,054**	**-0,3**	**-0,601**	1

The text in bold is significant with a p value of <0.05

5. Discussion and conclusion

The aim of thesis was to analyse the association between obesity and the quality of life for the inhabitants of Flevoland in the Netherlands. To accomplish this goal, the focus of this thesis was mainly on the three specific domains of quality of life, these are the mental, social and environmental domains. Therefore, three separate multiple linear regressions have been performed to support the existing literature. As a result, the three analyses in this thesis indicate an association between obesity and the quality of life in multiple domains. In all three of the analysis, obesity was significantly correlated to the different domains of the quality of life.

However, there are some differences between the mental and social domains compared to the environmental domain. While the social and mental domain are negatively associated by a significantly correlated obesity weight group compared to the normal weight group, the environmental domain seems to be positively correlated by being obese and by being overweight. Moreover, as expected according to the literature presented in chapter two, being overweight did not have the same effects on the mental domain and social domain. To the contrary, the environmental domain showed a significant positive sign for being overweight. Next to this, the significant signs for the social domain and the mental domain are in line with the literature mentioned in previous chapters that supported the idea that many aspects of the mental and social domain are negatively associated with obesity.

Besides obesity, some control variables had significant outcomes, and this was in line with the existing literature. For instance, smoking and the gender are both significant for all the multiple linear regressions and thus correlated to the factor analysis for the different domains. Nonetheless, the male gender is expected to be of a positive influence and smoking is expected to have a negative influence on the factor scores of the different domains. To the contrary, for the environmental domain the multiple linear regression results show the exact opposite. Next to this, the "medium level of education" and the "high level of education" are significant compared to the "No level of education" for the mental and social domains. However, this is not line with the expectations. Similar as the gender and smoking control variables, the environmental domain shows results that are not in line with literature because every educational level above "No educational level" is significant, while only the medium and high level of education was to be expected.

The mental domain and the social domain do have results that are in line with the expectations. However, the environmental domain does have results that are in contrast with the literature. The mental and social domains are both comprised of 5 separate effects that can be interpreted as different layers of the domains while the environmental domain consist of three separate variables. For instance, depression/having a sad mood is part of the mental domain and this aspect of the mental domain is

discussed various pieces of literature (de Wit *et al.*, 2010; Luppino *et al.*, 2010; Amiri *et al.*, 2018; Heo *et al.*, 2005). While being overweight did not have the same relationship with depression (Amiri *et al.*, 2018). Moreover, self-esteem and self-worth are negatively associated with obesity (Griffiths, 2010; Hill, 2017; Sánchez Arenas, 2015). Next to this, the possibility to change life and the feeling of helplessness are both expected to be associated with obesity (Connell O'Cathain and Brazier, 2014). Therefore, it was to be expected that obesity is negatively associated with the mental domain.

Next to the mental domain, the social domain was also to be expected to be negatively associated with obesity according to the literature above. For instance, the social life of individuals seems to be associated by their weight status (Christakis and Fowler, 2008; Zhang *et al.*, 2018; Valente *et al.*, 2009). Next to this, the lack of a social network was to be expected to be negatively associated with obesity (Herzer *et al.*, 2011, Çam and Üstüner Top, 2019, Leahey *et al.*, 2015). Therefore, the significant negative sign results for obesity were to be expected while being overweight was not to be expected to be associated with the social domain. According to the analysis, the negative sign of being obese was -0,195, while significant. In contrast, being overweight was not significant and thus is not expected to be negatively associated with the social domain, as the literature review expected.

To the contrary, the environmental domain was not in line with the expectations. For instance, the direct worsening of the environment of an individual was negatively associated with obesity. As an example, the walkability of a neighbourhood was associated with the local obesity levels (Barbosa *et al.*, 2019; Creatore *et al.*, 2016; Lee *et al.*, 2015 Suglia *et al.*, 2016). Moreover, the effect of weight discrimination at work and the self-discrimination is expected to be negatively associated with obesity (Flint *et al.*, 2016, Latner *et al.*,2014, Sutin and Terracciano, 2013). Therefore, it was to be expected that the environmental domain was negatively associated with obesity. However, the results show the contrary. To clarify, the environmental domain is not line with expectations and there are some explainable reasons for this. For instance, the environmental domain factor analysis only comprises of three different questions from a questionnaire used in Flevoland in the Netherlands. While one of these questions is on the financial security one could experience. The other two questions are on the distances for commuting to work by bike and by walking. This results in, both types of data being prone to age differences due to the fact pensioners probably have no commuting distances to work. However, based on the original dataset this outcome was to be expected for the environmental domain. Some of the data sources are somewhat applicable for the environmental domain, however it lacks data on important environmental factors that are ought to be associated with the

quality of life in some form. Therefore, in an ideal scenario there was more data on the living environment and more data on the weight discrimination of individuals. Especially, reliable living environment data is missing, and this is vital for the argumentation on the environmental domain of the quality of life. Without these data sources the current factor analysis on the environmental domain lacks context and is therefore not applicable compared to the social and mental domains.

Lastly, the control variables are expected to have some influence on the different domains as discussed in chapter 2. Especially, educational level is to be expected to influence the quality of life (Mielck *et al.*, 2012). Smoking is often associated with a reduction in the quality of life (Goldenberg *et al.* 2014). These effects are supported by the analysis presented in chapter 4 for the mental and social domain, with smoking showing a significant negative sign and a higher educational level than the low-level of education had a positive sign. Again, the analysis on the environmental domain is again in contrast with the literature and the other domain of the quality of life and thus shows a positive significant sign for smoking and only a small positive sign for only the highest educational level.

The hypothesis test for the mental and social domain are both supported by the analysis. To the contrary, the environmental domain hypothesis is not supported by the analysis since the results indicate a positive association where a negative association was expected.

Limitations to the study

The analysis shows some promising results that support the overall hypothesis. However, there are some limitations to the analysis and to the data that is used for the analysis. The strength of the analyses, the social and mental domain shows supportive evidence for the hypothesis and is in line with the expectations. The social and mental domains are better represented in the original data set and the factor analysis. Next to this, the original additional aim of the data gathering by the GGD Flevoland was to gain more in-depth knowledge on the social and mental domain. To the contrary, the environmental domain was not the focus of the original data gathering by the GGD. Therefore, there are many specific in-depth questions on the social and mental wellbeing of the individual. This resulted in a broader range of specific applicable data sources that can be directly linked to the literature on quality of life and the social and mental domain. While the detailed information on the environmental domain still is not available in this dataset.

Nevertheless, the error term of all the analysis were not fully normally distributed. This has however relatively small implications for the results. Nonetheless, a more complex analysis such as the

Tobit analysis could have been better for the data sources used as the dependent variable. Next to this, the multiple linear regression analysis makes the direction of influence hard to pinpoint. Therefore, the questions remains if obesity influences the quality of life or vice versa and therefore only an association can be found. Nevertheless, for analysing an association the multiple linear regression combined with these data sources are valid for determining the association between the quality of life and obesity.

Next to the data issues, the data origin province of Flevoland has some internal disparity that could be differentiating the results. For instance, Flevoland comprises some larger urban centres with surrounding rural areas that are substantial different in social-cultural values. Regardless, all these citizens together encompass the total demographic makeup of the province. On the other hand, the province of Flevoland is probably not a perfect proxy for the whole of the Netherlands. Hence, the results are limited in applicability to the province of Flevoland. Nevertheless, this was not the original aim of the thesis.

Recommendations for further research, policy and practice

First, the longitudinal study is superior to the cross-sectional approach in these types of quality-of-life related studies. For example, Luppino and colleagues (2010) did longitudinal studies on obesity and depression and decided to follow participants for a longer period to see the effects of depression on individuals with obesity and without obesity. This resulted in more in-depth knowledge on how obesity influences depressions and how depressions influence obesity. Therefore, longitudinal studies can provide a stronger base for argumentation. For this reason, future research can focus on longitudinal studies that follow individuals with obesity and without obesity to determine the effects on the quality of life and BMI. As a result, future studies about quality of life and obesity can incorporate cross-sectional studies and longitudinal studies to strengthen argumentation.

Second, in the future there should be broader data collection on the environmental situation of the individual. As an example, the environmental domain has many data flaws and lacks the most important information to make conclusive statements on the environmental domain part of the quality of life. At least, some additional data sources on walkability and existence of greenspaces in the neighbourhood of an individual would undoubtably improve the hypothesis testing. On the other hand, the hypothesis testing for the mental and social domain is thoroughly discussed in this thesis because there was a lot of cross-sectional data available for the inhabitants of Flevoland. However, research on the quality-of-life related consequences of obesity is scarce and important to the understanding of obesity. In addition, a better understanding of obesity and obesity related consequences and causes, can in return improve the treatment

of obesity. While loads of information is available on physical health and obesity, there is still room for improvement of a better understanding of the interplay between obesity and the quality of life.

The third suggestion for future research will be to focus of more large-scale research on greater geographical areas. For instance, one of the main limitations of this thesis is the focus on a relatively small geographical area. To enhance this, a greater geographical area such as the whole of the Netherlands could improve the applicability of the findings. In addition, one could also focus on the differentiation of urban and rural areas due to the social-cultural differences between urban areas and rural areas. After all, there is not much known about the social-cultural differences of urban and rural areas in relationship to obesity and the quality of life.

Lastly, future research should focus on the different aspect of the different domains of the quality of life. For instance, loneliness or helplessness can surely be a separate focus of research and in return could enhance the understanding of the interplay between self-reported perceptions and obesity.

Conclusion

In short, the results of the analysis are promising. The literature and the analysis can answer the research question: "*What is the association between obesity and the self-perceived quality of life of the adult inhabitant in Flevoland in the Netherlands?".*

To clarify, the quality of life was defined in chapter two as: *"The individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment"* (World health organisation, 1998). With this perspective in mind, obesity surely seems to be negatively associated with some of the aspects of quality of life. For instance, based on the presented analysis and literature there is a negative association between obesity and the self-perceived quality of life for the inhabitant of Flevoland in the Netherlands. Especially, the mental domain and social domain are in line with the literature and shows that obesity and lower score of the quality of life are correlated with a negative sign. To conclude, a lower score of the self-reported quality of life on the social and mental domain was found to be significant for people that suffer from obesity. In addition, the weight group 'overweight' did not have the same significant results and was thus different from the obesity weight class, this is also supported by the literature presented in this thesis.

Likewise, the educational level and smoking habits seem to be associated with the different domains of the quality of life.

The main aim of this thesis was to find the association between obesity and the quality of life. First, the argument for this hypothesis was supported by the existing literature. Secondly, the statistical analysis presented in this thesis also support the hypothesis. Above all, this thesis added just a small puzzle piece in the entire quality of life and obesity debate, and this could enhance the scientific base for further treatment and understanding of obesity. In conclusion, this thesis presented a literature overview and statistical tests to support the argumentation that there is an association between obesity and the self-reported quality of life within the social and mental domain, while the environmental domain lacks evidence to conclude the same.

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Appendix

Social domain	Mental domain	Environmental domain
Loneliness	Feeling of control	Financial situation
Connectivity	Feeling of sad mood	Work conditions
	Low self-worth	
	Helplessness	
	Possibilities	

Figure 4: The three different domains of the quality of life discussed in this thesis with the subdivisions of each domain.

Social domain	Range	Type
Loneliness		
I lack a person where I can go to discuss some of my problems	Yes - sort of - No	Ordinal
I experience emptiness in my life	Yes - sort of - No	Ordinal
I am lacking some sociability	Yes - sort of - No	Ordinal
Connectivity		
I often feel abandoned by people	Yes - sort of - No	Ordinal
I do not have a real close friend	Yes - sort of - No	Ordinal

Figure 5: The subdivisions of the social domain and related questions with their range and data type.

Mental domain	Range	Type
Feeling of control		
I do not feel control in my life	totally agree - do not agree at all	Ordinal
Feeling of sad mood		
How often do you feel a sad or depressive mood?	always - never	Ordinal
Low self-worth		
How often do you think you are worthless	always - never	Ordinal
Helplessness		
I feel helpless with some problems in life	totally agree - do not agree at all	Ordinal
Having Possibilities		

Having possibilities to change life	totally agree - do not agree at all	Ordinal

Figure 6: The subdivisions of the mental domain and related questions with their range and data type.

Enviromental	Range	Type
Financial situation		
Do you have difficulties paying the bills?	No difficulties at all- yes, al lot of difficulties	Ordinal
Work conditions		
How much time do you spend walking to work?	number	Ratio
How much time do you spend biking to work?	number	Ratio

Figure 7: The subdivisions of the environmental domain and related questions with their range and data type.

*** Syntax of coding**

```
RECODE LFRKA205 (1=1) (ELSE=0) INTO Smoking_yes.
VARIABLE LABELS  Smoking_yes 'SmokingYes'.
EXECUTE.
*Dummy variable for Smoking (smoking =1)

RECODE AGGSB201 (1=1) (ELSE=0) INTO Male.
VARIABLE LABELS  Male 'Male'.
EXECUTE.
*Dummy variable for the Gender (Male =1) (Woman=0)

RECODE MMOWB201 (2=1) (3=1) (ELSE=0) INTO Low_educational_level.
VARIABLE LABELS  Low_educational_level 'Low educational level'.
EXECUTE.
*Dummy variable for the education (low= 1 no edu=0)

RECODE MMOWB201 (4=2) (5=2) (6=2) (ELSE=0) INTO Medium_educational_level.
VARIABLE LABELS  Medium_educational_level 'Medium educational level'.
EXECUTE.
*Dummy variable for the education (medium= 2 no edu=0)

RECODE MMOWB201 (7=3) (8=3) (ELSE=0) INTO High_educational_level.
VARIABLE LABELS  High_educational_level 'High educational level'.
EXECUTE.
*Dummy variable for the education (high= 3 no edu=0)



* Encoding: UTF-8.
RECODE AGGWS203 (0=1) (ELSE=0) INTO Underweight.
VARIABLE LABELS  Underweight 'Underweight'.
EXECUTE.
*new weight group dummys
```

```
RECODE AGGWS203 (3=1) (ELSE=0) INTO Overweight.
VARIABLE LABELS  Overweight 'Overweight'.
EXECUTE.
*new weight group dummys

RECODE AGGWS203 (4=1) (ELSE=0) INTO Obese.
VARIABLE LABELS  Obese 'Obese'.
EXECUTE.
*new weight group dummys

DATASET ACTIVATE DataSet1.
FACTOR
  /VARIABLES GGADB207 GGADB210 GGADB204 GGRLB201 GGRLB202
  /MISSING LISTWISE
  /ANALYSIS GGADB207 GGADB210 GGADB204 GGRLB201 GGRLB202
  /PRINT INITIAL
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /SAVE REG(ALL)
  /METHOD=CORRELATION.
*mental domain factor produced


FACTOR
  /VARIABLES GGEEB203 GGEEB202 GGEEB210 Discus_problems GGEEB209
  /MISSING LISTWISE
  /ANALYSIS GGEEB203 GGEEB202 GGEEB210 Discus_problems GGEEB209
  /PRINT INITIAL
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /SAVE REG(ALL)
  /METHOD=CORRELATION.
*creating factor social domain

FACTOR
  /VARIABLES paying_bills walking Biking Chores heavy_work
  /MISSING LISTWISE
  /ANALYSIS paying_bills walking Biking Chores heavy_work
  /PRINT INITIAL ROTATION
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /CRITERIA ITERATE(25)
  /ROTATION VARIMAX
  /SAVE REG(ALL)
  /METHOD=CORRELATION.
*creating factor enviromental domain



DATASET ACTIVATE DataSet2.
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
```

```
  /DEPENDENT Mental_Fac
  /METHOD=ENTER Underweight Overweight Obese
  /METHOD=ENTER Underweight Overweight Obese leeftijd
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
     /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
Low_educational_level
    Medium_educational_level High_educational_level
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN NORMPROB(ZRESID)
  /SAVE PRED ZPRED RESID ZRESID.
*regression mental domain

DATASET ACTIVATE DataSet2.
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Enviromental_Fac
  /METHOD=ENTER Underweight Overweight Obese
  /METHOD=ENTER Underweight Overweight Obese leeftijd
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
     /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
Low_educational_level
    Medium_educational_level High_educational_level
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN NORMPROB(ZRESID)
  /SAVE PRED ZPRED RESID ZRESID.
*regression enviromental domain

DATASET ACTIVATE DataSet2.
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Social_Fac
  /METHOD=ENTER Underweight Overweight Obese
  /METHOD=ENTER Underweight Overweight Obese leeftijd
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
     /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
Low_educational_level
    Medium_educational_level High_educational_level
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN NORMPROB(ZRESID)
  /SAVE PRED ZPRED RESID ZRESID.
*regression social domain
```

*** SPSS 25 output**

```
GET
  FILE='H:\Scriptie\19maart.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
DATASET ACTIVATE DataSet1.
FACTOR
  /VARIABLES GGADB207 GGADB210 GGADB204 GGRLB201 GGRLB202
  /MISSING LISTWISE
  /ANALYSIS GGADB207 GGADB210 GGADB204 GGRLB201 GGRLB202
  /PRINT INITIAL
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /SAVE REG(ALL)
  /METHOD=CORRELATION.
```

Factor Analysis

Notes

Output Created	02-APR-2021 17:31:00
Comments	

Input	Data	H:\Scriptie\19maart.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	5220
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES GGADB207 GGADB210 GGADB204 GGRLB201 GGRLB202 /MISSING LISTWISE /ANALYSIS GGADB207 GGADB210 GGADB204 GGRLB201 GGRLB202 /PRINT INITIAL /PLOT EIGEN /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /ROTATION NOROTATE /SAVE REG(ALL) /METHOD=CORRELATION.
Resources	Processor Time	00:00:00,28
	Elapsed Time	00:00:00,21
	Maximum Memory Required	4576 (4,469K) bytes
Variables Created	FAC1_2	Component score 1

Communalities

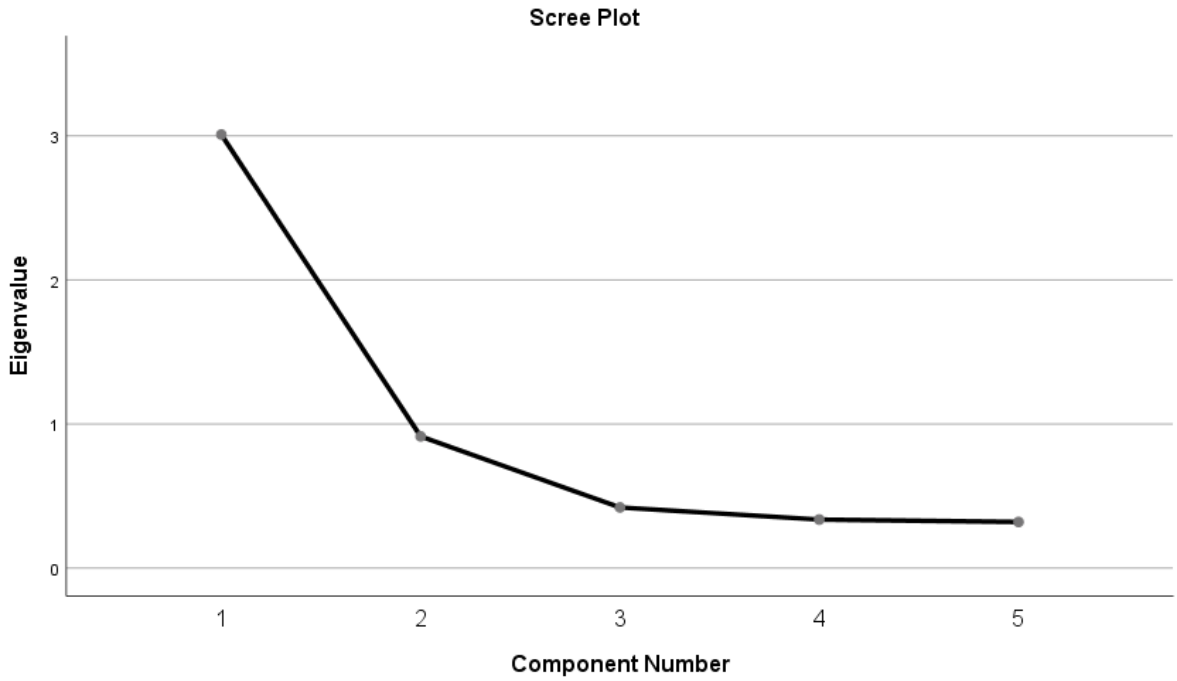
	Initial
Hoe vaak somber of depressief?	1,000
Hoe vaak afkeurenswaardig, minderwaardig of waardeloos?	1,000
Hoe vaak hopeloos?	1,000
Weinig controle over dingen die mij overkomen	1,000
Sommige van mijn problemen kan ik met geen mogelijkheid oplossen	1,000

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	3,009	60,177	60,177
2	,914	18,271	78,448
3	,421	8,416	86,864
4	,337	6,734	93,599
5	,320	6,401	100,000

Extraction Method: Principal Component Analysis.



Component Matrix[a]

a. 1 components extracted.

*mental domain factor produced.

```
FACTOR
  /VARIABLES GGEEB203 GGEEB202 GGEEB210 Discus_problems GGEEB209
  /MISSING LISTWISE
  /ANALYSIS GGEEB203 GGEEB202 GGEEB210 Discus_problems GGEEB209
  /PRINT INITIAL
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
```

/SAVE REG(ALL)

/METHOD=CORRELATION.

Factor Analysis

Notes

Output Created		02-APR-2021 17:31:09
Comments		
Input	Data	H:\Scriptie\19maart.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	5220
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.

Syntax		FACTOR /VARIABLES GGEEB203 GGEEB202 GGEEB210 Discus_problems GGEEB209 /MISSING LISTWISE /ANALYSIS GGEEB203 GGEEB202 GGEEB210 Discus_problems GGEEB209 /PRINT INITIAL /PLOT EIGEN /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /ROTATION NOROTATE /SAVE REG(ALL) /METHOD=CORRELATION.
Resources	Processor Time	00:00:00,23
	Elapsed Time	00:00:00,21
	Maximum Memory Required	4576 (4,469K) bytes
Variables Created	FAC1_3	Component score 1

Communalities

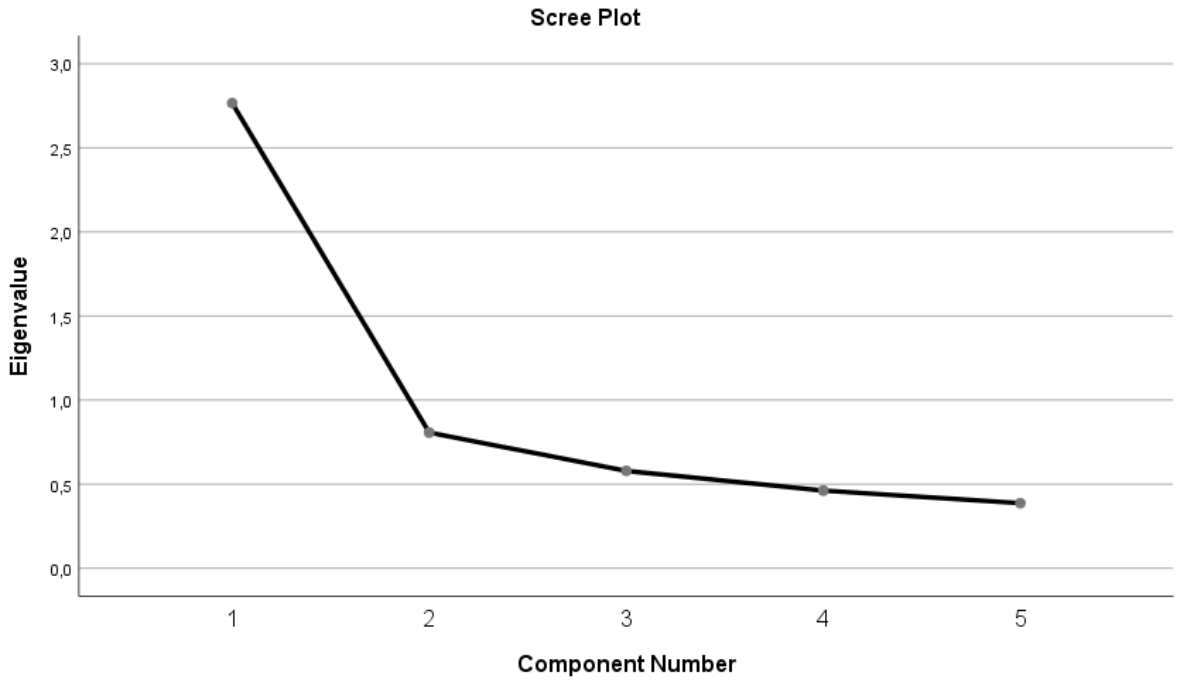
	Initial
Ervaar leegte	1,000
Mis goede vriend	1,000
Voel me vaak in de steekgelaten	1,000
Discussing problems	1,000
Mis mensen om me heen	1,000

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	2,766	55,312	55,312
2	,807	16,135	71,446
3	,579	11,576	83,023
4	,462	9,237	92,259
5	,387	7,741	100,000

Extraction Method: Principal Component Analysis.



Component Matrix[a]

a. 1 components extracted.

*creating factor social domain.

FACTOR

```
/VARIABLES paying_bills walking Biking Chores heavy_work
/MISSING LISTWISE
/ANALYSIS paying_bills walking Biking Chores heavy_work
/PRINT INITIAL ROTATION
/PLOT EIGEN
/CRITERIA MINEIGEN(1) ITERATE(25)
/EXTRACTION PC
/CRITERIA ITERATE(25)
/ROTATION VARIMAX
/SAVE REG(ALL)
/METHOD=CORRELATION.
```

Factor Analysis

Notes

Output Created		02-APR-2021 17:31:16
Comments		
Input	Data	H:\Scriptie\19maart.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	5220

Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES paying_bills walking Biking Chores heavy_work /MISSING LISTWISE /ANALYSIS paying_bills walking Biking Chores heavy_work /PRINT INITIAL ROTATION /PLOT EIGEN /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /SAVE REG(ALL) /METHOD=CORRELATION.
Resources	Processor Time	00:00:00,20
	Elapsed Time	00:00:00,20
	Maximum Memory Required	4576 (4,469K) bytes
Variables Created	FAC1_5	Component score 1
	FAC2_5	Component score 2

Communalities

	Initial
problems paying the bills	1,000
walking	1,000
Biking	1,000
Chores	1,000

heavy_work	1,000

Extraction Method: Principal Component Analysis.

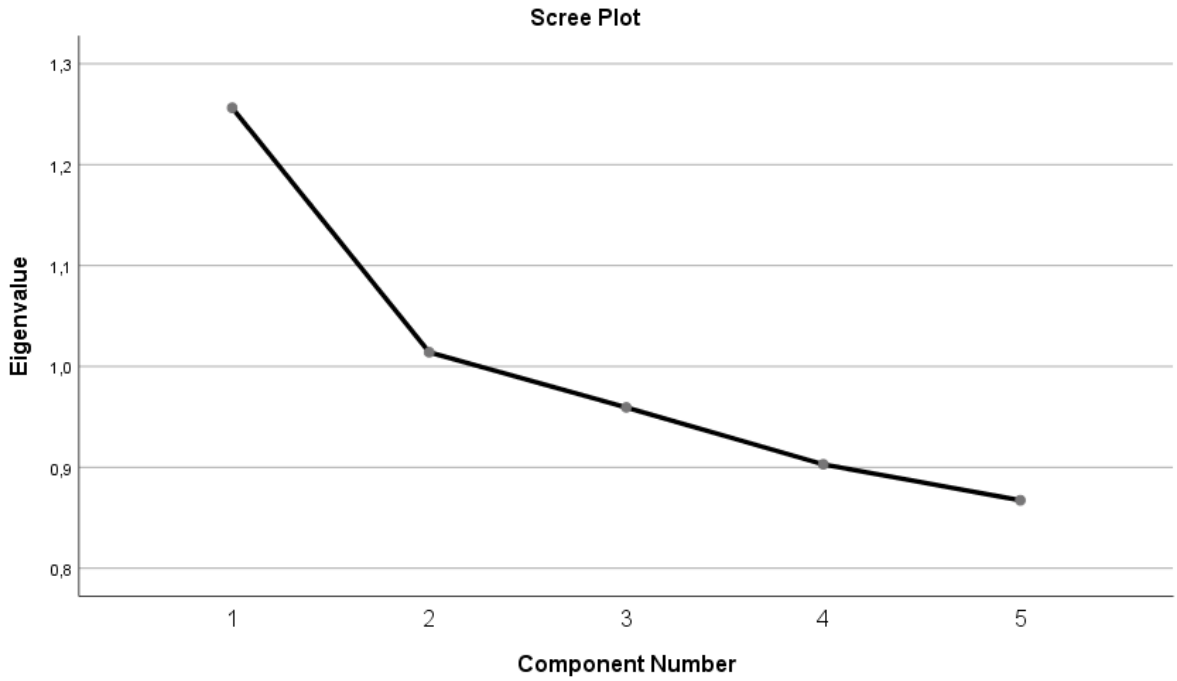
Total Variance Explained

	Initial Eigenvalues			Rotation Sums of Squared Loadings	
Component	Total	% of Variance	Cumulative %	Total	% of Variance
1	1,256	25,126	25,126	1,163	23,256
2	1,014	20,281	45,406	1,108	22,151
3	,959	19,188	64,594		
4	,903	18,059	82,653		
5	,867	17,347	100,000		

Total Variance Explained

	Rotation Sums of Squared Loadings
Component	Cumulative %
1	23,256
2	45,406
3	
4	
5	

Extraction Method: Principal Component Analysis.



Component Matrix[a]

a. 2 components extracted.

Rotated Component Matrix[a]

	Component	
	1	2
problems paying the bills	-,140	,791
walking	,659	,116
Biking	,634	-,201
Chores	,215	,581
heavy_work	,512	,301

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 3 iterations.

Component Transformation Matrix

Component	1	2
1	,784	,621
2	-,621	,784

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

*creating factor enviromental domain.

DATASET ACTIVATE DataSet2.

Dataset Activate

Notes

Output Created		02-APR-2021 17:31:23
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	5220
Syntax		DATASET ACTIVATE DataSet2.

Resources	Processor Time	00:00:00,00
	Elapsed Time	00:00:00,00

Warnings

Unknown dataset DataSet2.
Execution of this command stops.

```
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Mental_Fac
  /METHOD=ENTER Underweight Overweight Obese
  /METHOD=ENTER Underweight Overweight Obese leeftijd
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
Low_educational_level
    Medium_educational_level High_educational_level
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN NORMPROB(ZRESID)
  /SAVE PRED ZPRED RESID ZRESID.
```

Regression

Notes

Output Created		02-APR-2021 17:31:23
Comments		
Input	Data	H:\Scriptie\19maart.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	5220
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.

Syntax		REGRESSION /DESCRIPTIVES MEAN STDDEV CORR SIG N /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Mental_Fac /METHOD=ENTER Underweight Overweight Obese /METHOD=ENTER Underweight Overweight Obese leeftijd /METHOD=ENTER Underweight Overweight Obese leeftijd Male /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes Low_educational_level Medium_educational_level High_educational_level /SCATTERPLOT=(*ZRESID,*ZPRED) /RESIDUALS DURBIN NORMPROB(ZRESID) /SAVE PRED ZPRED RESID ZRESID.
Resources	Processor Time	00:00:00,77
	Elapsed Time	00:00:00,71
	Memory Required	18864 bytes

	Additional Memory Required for Residual Plots	208 bytes
Variables Created or Modified	PRE_2	Unstandardized Predicted Value
	RES_2	Unstandardized Residual
	ZPR_2	Standardized Predicted Value
	ZRE_4	Standardized Residual

Descriptive Statistics

	Mean	Std. Deviation	N
REGR factor score 1 for analysis 1	,0000000	1,00000000	4831
Underweight	,0139	,11696	4831
Overweight	,3867	,48704	4831
Obese	,1679	,37379	4831
Leeftijd op peildatum 1.9.2016	61,1267	16,67033	4831
Male	,4604	,49848	4831
SmokingYes	,1434	,35057	4831
Low educational level	,2267	,41871	4831
Medium educational level	1,0031	1,00010	4831
High educational level	,6980	1,26772	4831

Correlations

		REGR factor score 1 for analysis 1	Underweight	Overweight	Obese
Pearson Correlation	REGR factor score 1 for analysis 1	1,000	-,034	,033	-,083
	Underweight	-,034	1,000	-,094	-,053
	Overweight	,033	-,094	1,000	-,357
	Obese	-,083	-,053	-,357	1,000
	Leeftijd op peildatum 1.9.2016	-,013	-,045	,094	,057

	Male	,117	-,078	,128	-,022
	SmokingYes	-,084	,037	-,019	-,056
	Low educational level	-,130	-,005	,023	,095
	Medium educational level	,027	,016	,009	-,007
	High educational level	,130	-,015	-,021	-,090
Sig. (1-tailed)	REGR factor score 1 for analysis 1	.	,009	,011	,000
	Underweight	,009	.	,000	,000
	Overweight	,011	,000	.	,000
	Obese	,000	,000	,000	.
	Leeftijd op peildatum 1.9.2016	,191	,001	,000	,000
	Male	,000	,000	,000	,068
	SmokingYes	,000	,005	,089	,000
	Low educational level	,000	,364	,055	,000
	Medium educational level	,029	,140	,275	,301
	High educational level	,000	,148	,075	,000
N	REGR factor score 1 for analysis 1	4831	4831	4831	4831
	Underweight	4831	4831	4831	4831
	Overweight	4831	4831	4831	4831
	Obese	4831	4831	4831	4831
	Leeftijd op peildatum 1.9.2016	4831	4831	4831	4831
	Male	4831	4831	4831	4831
	SmokingYes	4831	4831	4831	4831
	Low educational level	4831	4831	4831	4831
	Medium educational level	4831	4831	4831	4831
	High educational level	4831	4831	4831	4831

Correlations

		Leeftijd op peildatum 1.9.2016	Male	SmokingYes	Low educational level
Pearson Correlation	REGR factor score 1 for analysis 1	-,013	,117	-,084	-,130
	Underweight	-,045	-,078	,037	-,005

	Overweight	,094	,128	-,019	,023
	Obese	,057	-,022	-,056	,095
	Leeftijd op peildatum 1.9.2016	1,000	,083	-,112	,274
	Male	,083	1,000	,043	-,059
	SmokingYes	-,112	,043	1,000	,010
	Low educational level	,274	-,059	,010	1,000
	Medium educational level	-,088	,004	,029	-,543
	High educational level	-,171	,057	-,052	-,298
Sig. (1-tailed)	REGR factor score 1 for analysis 1	,191	,000	,000	,000
	Underweight	,001	,000	,005	,364
	Overweight	,000	,000	,089	,055
	Obese	,000	,068	,000	,000
	Leeftijd op peildatum 1.9.2016	.	,000	,000	,000
	Male	,000	.	,002	,000
	SmokingYes	,000	,002	.	,249
	Low educational level	,000	,000	,249	.
	Medium educational level	,000	,396	,022	,000
	High educational level	,000	,000	,000	,000
N	REGR factor score 1 for analysis 1	4831	4831	4831	4831
	Underweight	4831	4831	4831	4831
	Overweight	4831	4831	4831	4831
	Obese	4831	4831	4831	4831
	Leeftijd op peildatum 1.9.2016	4831	4831	4831	4831
	Male	4831	4831	4831	4831
	SmokingYes	4831	4831	4831	4831
	Low educational level	4831	4831	4831	4831
	Medium educational level	4831	4831	4831	4831
	High educational level	4831	4831	4831	4831

Correlations

		Medium educational level	High educational level

Pearson Correlation	REGR factor score 1 for analysis 1	,027	,130
	Underweight	,016	-,015
	Overweight	,009	-,021
	Obese	-,007	-,090
	Leeftijd op peildatum 1.9.2016	-,088	-,171
	Male	,004	,057
	SmokingYes	,029	-,052
	Low educational level	-,543	-,298
	Medium educational level	1,000	-,552
	High educational level	-,552	1,000
Sig. (1-tailed)	REGR factor score 1 for analysis 1	,029	,000
	Underweight	,140	,148
	Overweight	,275	,075
	Obese	,301	,000
	Leeftijd op peildatum 1.9.2016	,000	,000
	Male	,396	,000
	SmokingYes	,022	,000
	Low educational level	,000	,000
	Medium educational level	.	,000
	High educational level	,000	.
N	REGR factor score 1 for analysis 1	4831	4831
	Underweight	4831	4831
	Overweight	4831	4831
	Obese	4831	4831
	Leeftijd op peildatum 1.9.2016	4831	4831
	Male	4831	4831
	SmokingYes	4831	4831
	Low educational level	4831	4831
	Medium educational level	4831	4831
	High educational level	4831	4831

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method

1	Obese, Underweight, Overweight[b]	.	Enter
2	Leeftijd op peildatum 1.9.2016[b]	.	Enter
3	Male[b]	.	Enter
4	SmokingYes[b]	.	Enter
5	Medium educational level, Low educational level, High educational level[b]	.	Enter

a. Dependent Variable: REGR factor score 1 for analysis 1

b. All requested variables entered.

Model Summary[f]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,091[a]	,008	,008	,99613613	,008	13,514
2	,092[b]	,008	,008	,99619454	,000	,434
3	,147[c]	,022	,021	,98966683	,013	64,873
4	,175[d]	,031	,029	,98514549	,009	45,390
5	,234[e]	,055	,053	,97308235	,024	41,115

Model Summary[f]

Model	Change Statistics			
	df1	df2	Sig. F Change	
1	3	4827	,000	
2	1	4826	,510	
3	1	4825	,000	

4	1	4824	,000	
5	3	4821	,000	1,338

a. Predictors: (Constant), Obese, Underweight, Overweight

b. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016

c. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male

d. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes

e. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes, Medium educational level, Low educational level, High educational level

f. Dependent Variable: REGR factor score 1 for analysis 1

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40,230	3	13,410	13,514	,000[b]
	Residual	4789,770	4827	,992		
	Total	4830,000	4830			
2	Regression	40,660	4	10,165	10,243	,000[c]
	Residual	4789,340	4826	,992		
	Total	4830,000	4830			
3	Regression	104,200	5	20,840	21,277	,000[d]
	Residual	4725,800	4825	,979		
	Total	4830,000	4830			
4	Regression	148,252	6	24,709	25,459	,000[e]
	Residual	4681,748	4824	,971		
	Total	4830,000	4830			
5	Regression	265,047	9	29,450	31,101	,000[f]
	Residual	4564,953	4821	,947		
	Total	4830,000	4830			

a. Dependent Variable: REGR factor score 1 for analysis 1

b. Predictors: (Constant), Obese, Underweight, Overweight

c. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016

d. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male

e. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes

f. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes, Medium educational level, Low educational level, High educational level

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,044	,022		1,998	,046
	Underweight	-,330	,124	-,039	-2,670	,008
	Overweight	-,002	,032	-,001	-,062	,951
	Obese	-,228	,041	-,085	-5,527	,000
2	(Constant)	,077	,055		1,392	,164
	Underweight	-,332	,124	-,039	-2,687	,007
	Overweight	,001	,032	,000	,017	,987
	Obese	-,225	,041	-,084	-5,439	,000
	Leeftijd op peildatum 1.9.2016	-,001	,001	-,010	-,659	,510
3	(Constant)	,010	,056		,176	,860
	Underweight	-,270	,123	-,032	-2,196	,028
	Overweight	-,028	,032	-,014	-,885	,376
	Obese	-,230	,041	-,086	-5,583	,000
	Leeftijd op peildatum 1.9.2016	-,001	,001	-,017	-1,209	,227
	Male	,233	,029	,116	8,054	,000
4	(Constant)	,088	,057		1,546	,122
	Underweight	-,245	,123	-,029	-2,000	,046
	Overweight	-,035	,032	-,017	-1,104	,270
	Obese	-,245	,041	-,092	-5,972	,000
	Leeftijd op peildatum 1.9.2016	-,002	,001	-,028	-1,935	,053
	Male	,244	,029	,122	8,462	,000
	SmokingYes	-,275	,041	-,096	-6,737	,000
5	(Constant)	-,426	,091		-4,683	,000
	Underweight	-,222	,121	-,026	-1,830	,067
	Overweight	-,021	,032	-,010	-,668	,504

	Obese	-,197	,041	-,073	-4,817	,000
	Leeftijd op peildatum 1.9.2016	,001	,001	,016	1,050	,294
	Male	,213	,029	,106	7,441	,000
	SmokingYes	-,238	,041	-,084	-5,887	,000
	Low educational level	,127	,077	,053	1,652	,099
	Medium educational level	,190	,037	,190	5,164	,000
	High educational level	,186	,026	,236	7,269	,000

a. Dependent Variable: REGR factor score 1 for analysis 1

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	
1	Leeftijd op peildatum 1.9.2016	-,010[b]	-,659	,510	-,009	
	Male	,115[b]	7,990	,000	,114	
	SmokingYes	-,088[b]	-6,117	,000	-,088	
	Low educational level	-,124[b]	-8,643	,000	-,123	
	Medium educational level	,027[b]	1,902	,057	,027	
	High educational level	,123[b]	8,622	,000	,123	
2	Male	,116[c]	8,054	,000	,115	
	SmokingYes	-,090[c]	-6,221	,000	-,089	
	Low educational level	-,130[c]	-8,783	,000	-,125	
	Medium educational level	,027[c]	1,850	,064	,027	
	High educational level	,125[c]	8,627	,000	,123	
3	SmokingYes	-,096[d]	-6,737	,000	-,097	
	Low educational level	-,121[d]	-8,162	,000	-,117	
	Medium educational level	,025[d]	1,782	,075	,026	
	High educational level	,117[d]	8,104	,000	,116	
4	Low educational level	-,116[e]	-7,851	,000	-,112	
	Medium educational level	,027[e]	1,916	,055	,028	
	High educational level	,110[e]	7,604	,000	,109	

Excluded Variables[a]

Model		Collinearity Statistics Tolerance
1	Leeftijd op peildatum 1.9.2016	,981
	Male	,979
	SmokingYes	,994
	Low educational level	,987
	Medium educational level	1,000
	High educational level	,988
2	Male	,974
	SmokingYes	,983
	Low educational level	,918
	Medium educational level	,992
	High educational level	,962
3	SmokingYes	,980
	Low educational level	,911
	Medium educational level	,992
	High educational level	,957
4	Low educational level	,908
	Medium educational level	,991
	High educational level	,951

a. Dependent Variable: REGR factor score 1 for analysis 1

b. Predictors in the Model: (Constant), Obese, Underweight, Overweight

c. Predictors in the Model: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016

d. Predictors in the Model: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male

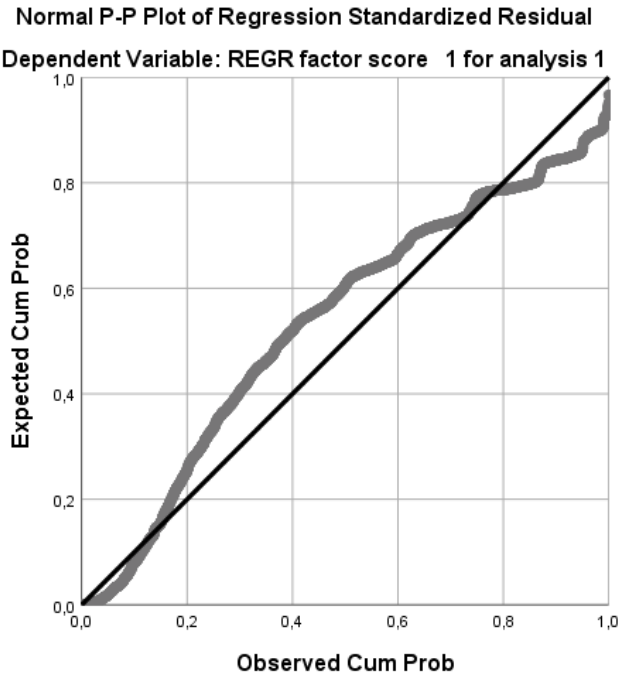
e. Predictors in the Model: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes

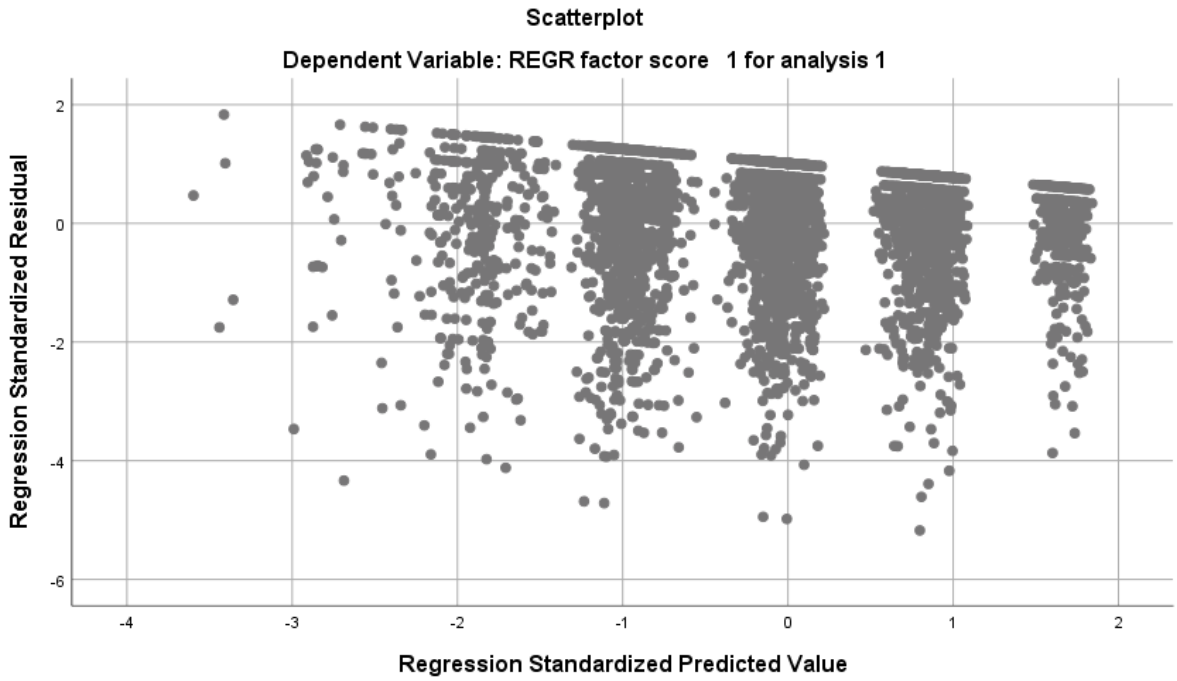
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-,8427546	,4308902	,0000000	,23425440	4831
Residual	-5,03472233	1,78301215	,00000000	,97217533	4831
Std. Predicted Value	-3,598	1,839	,000	1,000	4831
Std. Residual	-5,174	1,832	,000	,999	4831

a. Dependent Variable: REGR factor score 1 for analysis 1

Charts





*regression mental domain.

DATASET ACTIVATE DataSet2.

Dataset Activate

Notes

Output Created		02-APR-2021 17:31:29
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>

	N of Rows in Working Data File		5220
Syntax		DATASET DataSet2.	ACTIVATE
Resources	Processor Time		00:00:00,00
	Elapsed Time		00:00:00,00

Warnings

Unknown dataset DataSet2.
Execution of this command stops.

```
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Enviromental_Fac
  /METHOD=ENTER Underweight Overweight Obese
  /METHOD=ENTER Underweight Overweight Obese leeftijd
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
Low_educational_level
    Medium_educational_level High_educational_level
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN NORMPROB(ZRESID)
  /SAVE PRED ZPRED RESID ZRESID.
```

Regression

Notes

Output Created		02-APR-2021 17:31:29
Comments		
Input	Data	H:\Scriptie\19maart.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	5220
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.

Syntax		REGRESSION /DESCRIPTIVES MEAN STDDEV CORR SIG N /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Enviromental_Fac /METHOD=ENTER Underweight Overweight Obese /METHOD=ENTER Underweight Overweight Obese leeftijd /METHOD=ENTER Underweight Overweight Obese leeftijd Male /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes Low_educational_level Medium_educational_level High_educational_level /SCATTERPLOT=(*ZRESID,*ZPRED) /RESIDUALS DURBIN NORMPROB(ZRESID) /SAVE PRED ZPRED RESID ZRESID.
Resources	Processor Time	00:00:00,78
	Elapsed Time	00:00:00,70
	Memory Required	19024 bytes

	Additional Memory Required for Residual Plots	208 bytes
Variables Created or Modified	PRE_3	Unstandardized Predicted Value
	RES_3	Unstandardized Residual
	ZPR_3	Standardized Predicted Value
	ZRE_5	Standardized Residual

Descriptive Statistics

	Mean	Std. Deviation	N
REGR factor score 1 for analysis 2	,0000000	1,00000000	4283
Underweight	,0142	,11850	4283
Overweight	,3892	,48763	4283
Obese	,1672	,37317	4283
Leeftijd op peildatum 1.9.2016	60,1543	16,62819	4283
Male	,4653	,49885	4283
SmokingYes	,1464	,35354	4283
Low educational level	,2139	,41008	4283
Medium educational level	1,0423	,99922	4283
High educational level	,7467	1,29726	4283

Correlations

		REGR factor score 1 for analysis 2	Underweight	Overweight	Obese
Pearson Correlation	REGR factor score 1 for analysis 2	1,000	-,015	,030	,067
	Underweight	-,015	1,000	-,096	-,054
	Overweight	,030	-,096	1,000	-,358
	Obese	,067	-,054	-,358	1,000
	Leeftijd op peildatum 1.9.2016	,379	-,036	,104	,053

	Male	-,035	-,077	,136	-,025
	SmokingYes	-,009	,039	-,023	-,053
	Low educational level	,125	,005	,020	,099
	Medium educational level	-,086	,009	,007	-,013
	High educational level	-,026	-,019	-,017	-,091
Sig. (1-tailed)	REGR factor score 1 for analysis 2	.	,156	,024	,000
	Underweight	,156	.	,000	,000
	Overweight	,024	,000	.	,000
	Obese	,000	,000	,000	.
	Leeftijd op peildatum 1.9.2016	,000	,009	,000	,000
	Male	,011	,000	,000	,049
	SmokingYes	,273	,005	,066	,000
	Low educational level	,000	,382	,091	,000
	Medium educational level	,000	,284	,324	,203
	High educational level	,041	,106	,140	,000
N	REGR factor score 1 for analysis 2	4283	4283	4283	4283
	Underweight	4283	4283	4283	4283
	Overweight	4283	4283	4283	4283
	Obese	4283	4283	4283	4283
	Leeftijd op peildatum 1.9.2016	4283	4283	4283	4283
	Male	4283	4283	4283	4283
	SmokingYes	4283	4283	4283	4283
	Low educational level	4283	4283	4283	4283
	Medium educational level	4283	4283	4283	4283
	High educational level	4283	4283	4283	4283

Correlations

		Leeftijd op peildatum 1.9.2016	Male	SmokingYes	Low educational level
Pearson Correlation	REGR factor score 1 for analysis 2	,379	-,035	-,009	,125
	Underweight	-,036	-,077	,039	,005

	Overweight	,104	,136	-,023	,020
	Obese	,053	-,025	-,053	,099
	Leeftijd op peildatum 1.9.2016	1,000	,102	-,098	,270
	Male	,102	1,000	,032	-,052
	SmokingYes	-,098	,032	1,000	,010
	Low educational level	,270	-,052	,010	1,000
	Medium educational level	-,085	,005	,036	-,544
	High educational level	-,169	,052	-,054	-,300
Sig. (1-tailed)	REGR factor score 1 for analysis 2	,000	,011	,273	,000
	Underweight	,009	,000	,005	,382
	Overweight	,000	,000	,066	,091
	Obese	,000	,049	,000	,000
	Leeftijd op peildatum 1.9.2016	.	,000	,000	,000
	Male	,000	.	,018	,000
	SmokingYes	,000	,018	.	,267
	Low educational level	,000	,000	,267	.
	Medium educational level	,000	,371	,009	,000
	High educational level	,000	,000	,000	,000
N	REGR factor score 1 for analysis 2	4283	4283	4283	4283
	Underweight	4283	4283	4283	4283
	Overweight	4283	4283	4283	4283
	Obese	4283	4283	4283	4283
	Leeftijd op peildatum 1.9.2016	4283	4283	4283	4283
	Male	4283	4283	4283	4283
	SmokingYes	4283	4283	4283	4283
	Low educational level	4283	4283	4283	4283
	Medium educational level	4283	4283	4283	4283
	High educational level	4283	4283	4283	4283

Correlations

		Medium educational level	High educational level

Pearson Correlation	REGR factor score 1 for analysis 2	-,086	-,026
	Underweight	,009	-,019
	Overweight	,007	-,017
	Obese	-,013	-,091
	Leeftijd op peildatum 1.9.2016	-,085	-,169
	Male	,005	,052
	SmokingYes	,036	-,054
	Low educational level	-,544	-,300
	Medium educational level	1,000	-,601
	High educational level	-,601	1,000
Sig. (1-tailed)	REGR factor score 1 for analysis 2	,000	,041
	Underweight	,284	,106
	Overweight	,324	,140
	Obese	,203	,000
	Leeftijd op peildatum 1.9.2016	,000	,000
	Male	,371	,000
	SmokingYes	,009	,000
	Low educational level	,000	,000
	Medium educational level	.	,000
	High educational level	,000	.
N	REGR factor score 1 for analysis 2	4283	4283
	Underweight	4283	4283
	Overweight	4283	4283
	Obese	4283	4283
	Leeftijd op peildatum 1.9.2016	4283	4283
	Male	4283	4283
	SmokingYes	4283	4283
	Low educational level	4283	4283
	Medium educational level	4283	4283
	High educational level	4283	4283

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method

1	Obese, Underweight, Overweight[b]	.	Enter
2	Leeftijd op peildatum 1.9.2016[b]	.	Enter
3	Male[b]	.	Enter
4	SmokingYes[b]	.	Enter
5	Medium educational level, Low educational level, High educational level[b]	.	Enter

a. Dependent Variable: REGR factor score 1 for analysis 2

b. All requested variables entered.

Model Summary[f]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,089[a]	,008	,007	,99641062	,008	11,302
2	,382[b]	,146	,145	,92445002	,138	693,095
3	,389[c]	,152	,151	,92157473	,006	27,736
4	,391[d]	,153	,152	,92104285	,001	5,941
5	,395[e]	,156	,154	,91951129	,003	5,752

Model Summary[f]

Model	Change Statistics			
	df1	df2	Sig. F Change	
1	3	4279	,000	
2	1	4278	,000	
3	1	4277	,000	

4	1	4276	,015	
5	3	4273	,001	1,944

a. Predictors: (Constant), Obese, Underweight, Overweight

b. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016

c. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male

d. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes

e. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes, Medium educational level, Low educational level, High educational level

f. Dependent Variable: REGR factor score 1 for analysis 2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33,663	3	11,221	11,302	,000[b]
	Residual	4248,337	4279	,993		
	Total	4282,000	4282			
2	Regression	625,988	4	156,497	183,121	,000[c]
	Residual	3656,012	4278	,855		
	Total	4282,000	4282			
3	Regression	649,544	5	129,909	152,960	,000[d]
	Residual	3632,456	4277	,849		
	Total	4282,000	4282			
4	Regression	654,584	6	109,097	128,604	,000[e]
	Residual	3627,416	4276	,848		
	Total	4282,000	4282			
5	Regression	669,174	9	74,353	87,939	,000[f]
	Residual	3612,826	4273	,846		
	Total	4282,000	4282			

a. Dependent Variable: REGR factor score 1 for analysis 2

b. Predictors: (Constant), Obese, Underweight, Overweight

c. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016

d. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male

e. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes

f. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes, Medium educational level, Low educational level, High educational level

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-,088	,023		-3,793	,000
	Underweight	-,041	,130	-,005	-,312	,755
	Overweight	,126	,034	,061	3,735	,000
	Obese	,238	,044	,089	5,413	,000
2	(Constant)	-1,390	,054		-25,766	,000
	Underweight	,015	,120	,002	,127	,899
	Overweight	,019	,032	,009	,592	,554
	Obese	,135	,041	,050	3,290	,001
	Leeftijd op peildatum 1.9.2016	,023	,001	,376	26,327	,000
3	(Constant)	-1,350	,054		-24,872	,000
	Underweight	-,023	,120	-,003	-,195	,845
	Overweight	,038	,032	,019	1,200	,230
	Obese	,137	,041	,051	3,357	,001
	Leeftijd op peildatum 1.9.2016	,023	,001	,382	26,764	,000
	Male	-,151	,029	-,075	-5,267	,000
4	(Constant)	-1,377	,055		-24,881	,000
	Underweight	-,033	,120	-,004	-,275	,783
	Overweight	,041	,032	,020	1,283	,199
	Obese	,142	,041	,053	3,485	,000
	Leeftijd op peildatum 1.9.2016	,023	,001	,386	26,890	,000
	Male	-,154	,029	-,077	-5,379	,000
	SmokingYes	,098	,040	,035	2,437	,015
5	(Constant)	-1,319	,126		-10,464	,000
	Underweight	-,025	,120	-,003	-,207	,836
	Overweight	,045	,032	,022	1,425	,154

	Obese	,150	,041	,056	3,653	,000
	Leeftijd op peildatum 1.9.2016	,023	,001	,388	25,889	,000
	Male	-,158	,029	-,079	-5,474	,000
	SmokingYes	,107	,040	,038	2,659	,008
	Low educational level	-,050	,115	-,021	-,436	,663
	Medium educational level	-,060	,056	-,060	-1,058	,290
	High educational level	,007	,038	,009	,172	,864

a. Dependent Variable: REGR factor score 1 for analysis 2

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	
1	Leeftijd op peildatum 1.9.2016	,376[b]	26,327	,000	,373	
	Male	-,042[b]	-2,750	,006	-,042	
	SmokingYes	-,003[b]	-,195	,845	-,003	
	Low educational level	,116[b]	7,625	,000	,116	
	Medium educational level	-,085[b]	-5,621	,000	-,086	
	High educational level	-,018[b]	-1,154	,249	-,018	
2	Male	-,075[c]	-5,267	,000	-,080	
	SmokingYes	,031[c]	2,177	,030	,033	
	Low educational level	,019[c]	1,312	,190	,020	
	Medium educational level	-,054[c]	-3,815	,000	-,058	
	High educational level	,043[c]	3,014	,003	,046	
3	SmokingYes	,035[d]	2,437	,015	,037	
	Low educational level	,013[d]	,882	,378	,013	
	Medium educational level	-,053[d]	-3,762	,000	-,057	
	High educational level	,049[d]	3,406	,001	,052	
4	Low educational level	,011[e]	,770	,442	,012	
	Medium educational level	-,054[e]	-3,832	,000	-,059	
	High educational level	,052[e]	3,615	,000	,055	

Excluded Variables[a]

Model		Collinearity Statistics Tolerance
1	Leeftijd op peildatum 1.9.2016	,979
	Male	,977
	SmokingYes	,994
	Low educational level	,986
	Medium educational level	1,000
	High educational level	,988
2	Male	,970
	SmokingYes	,986
	Low educational level	,919
	Medium educational level	,993
	High educational level	,963
3	SmokingYes	,984
	Low educational level	,912
	Medium educational level	,992
	High educational level	,958
4	Low educational level	,910
	Medium educational level	,992
	High educational level	,952

a. Dependent Variable: REGR factor score 1 for analysis 2

b. Predictors in the Model: (Constant), Obese, Underweight, Overweight

c. Predictors in the Model: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016

d. Predictors in the Model: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male

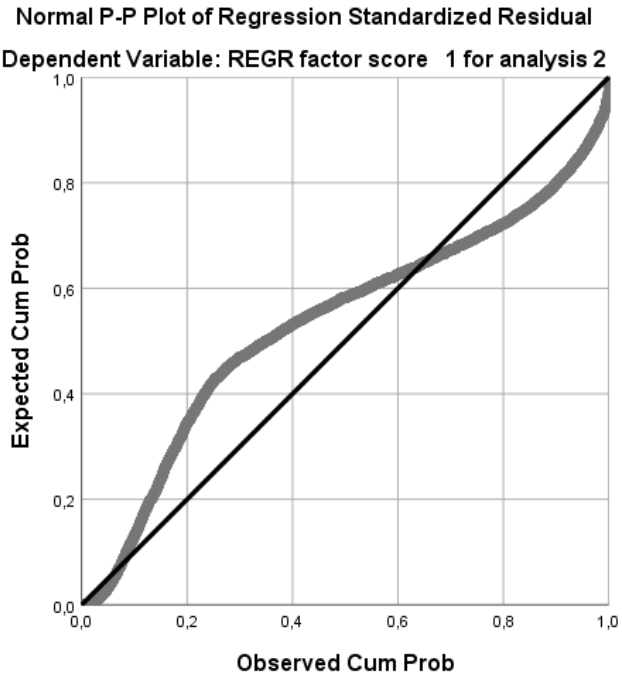
e. Predictors in the Model: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes

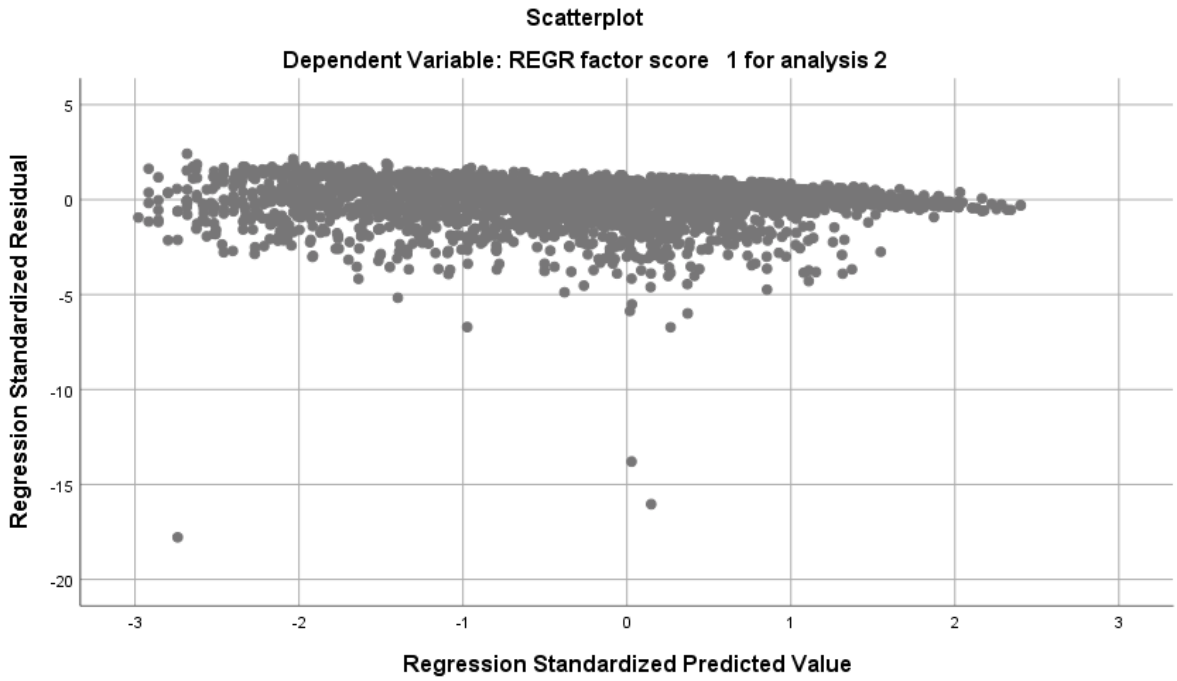
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-1,1779393	,9491260	,0000000	,39531769	4283
Residual	-16,35105896	2,21993828	,00000000	,91854446	4283
Std. Predicted Value	-2,980	2,401	,000	1,000	4283
Std. Residual	-17,782	2,414	,000	,999	4283

a. Dependent Variable: REGR factor score 1 for analysis 2

Charts





*regression enviromental domain.

DATASET ACTIVATE DataSet2.

Dataset Activate

Notes

Output Created		02-APR-2021 17:31:34
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>

	N of Rows in Working Data File		5220
Syntax		DATASET ACTIVATE DataSet2.	
Resources	Processor Time		00:00:00,00
	Elapsed Time		00:00:00,00

Warnings

Unknown dataset DataSet2.
Execution of this command stops.

```
REGRESSION
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  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Social_Fac
  /METHOD=ENTER Underweight Overweight Obese
  /METHOD=ENTER Underweight Overweight Obese leeftijd
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
  /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes
Low_educational_level
    Medium_educational_level High_educational_level
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN NORMPROB(ZRESID)
  /SAVE PRED ZPRED RESID ZRESID.
```

Regression

Notes

Output Created		02-APR-2021 17:31:34
Comments		
Input	Data	H:\Scriptie\19maart.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	5220
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.

Syntax		REGRESSION /DESCRIPTIVES MEAN STDDEV CORR SIG N /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Social_Fac /METHOD=ENTER Underweight Overweight Obese /METHOD=ENTER Underweight Overweight Obese leeftijd /METHOD=ENTER Underweight Overweight Obese leeftijd Male /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes /METHOD=ENTER Underweight Overweight Obese leeftijd Male Smoking_yes Low_educational_level Medium_educational_level High_educational_level /SCATTERPLOT=(*ZRESID,*ZPRED) /RESIDUALS DURBIN NORMPROB(ZRESID) /SAVE PRED ZPRED RESID ZRESID.
Resources	Processor Time	00:00:00,78
	Elapsed Time	00:00:00,71
	Memory Required	19184 bytes

	Additional Memory Required for Residual Plots	208 bytes
Variables Created or Modified	PRE_4	Unstandardized Predicted Value
	RES_4	Unstandardized Residual
	ZPR_4	Standardized Predicted Value
	ZRE_6	Standardized Residual

Descriptive Statistics

	Mean	Std. Deviation	N
REGR factor score 1 for analysis 1	,0000000	1,00000000	4699
Underweight	,0132	,11412	4699
Overweight	,3848	,48659	4699
Obese	,1690	,37477	4699
Leeftijd op peildatum 1.9.2016	61,0604	16,62080	4699
Male	,4616	,49858	4699
SmokingYes	,1432	,35034	4699
Low educational level	,2252	,41773	4699
Medium educational level	1,0228	,99985	4699
High educational level	,7093	1,27481	4699

Correlations

		REGR factor score 1 for analysis 1	Underweight	Overweight	Obese
Pearson Correlation	REGR factor score 1 for analysis 1	1,000	-,010	,016	-,073
	Underweight	-,010	1,000	-,091	-,052
	Overweight	,016	-,091	1,000	-,357
	Obese	-,073	-,052	-,357	1,000
	Leeftijd op peildatum 1.9.2016	-,028	-,040	,091	,060

	Male	,055	-,073	,131	-,019
	SmokingYes	-,086	,033	-,017	-,055
	Low educational level	-,076	-,009	,017	,094
	Medium educational level	,013	,016	,012	-,003
	High educational level	,088	-,012	-,019	-,092
Sig. (1-tailed)	REGR factor score 1 for analysis 1	.	,253	,140	,000
	Underweight	,253	.	,000	,000
	Overweight	,140	,000	.	,000
	Obese	,000	,000	,000	.
	Leeftijd op peildatum 1.9.2016	,029	,003	,000	,000
	Male	,000	,000	,000	,099
	SmokingYes	,000	,013	,116	,000
	Low educational level	,000	,274	,127	,000
	Medium educational level	,191	,136	,211	,406
	High educational level	,000	,212	,096	,000
N	REGR factor score 1 for analysis 1	4699	4699	4699	4699
	Underweight	4699	4699	4699	4699
	Overweight	4699	4699	4699	4699
	Obese	4699	4699	4699	4699
	Leeftijd op peildatum 1.9.2016	4699	4699	4699	4699
	Male	4699	4699	4699	4699
	SmokingYes	4699	4699	4699	4699
	Low educational level	4699	4699	4699	4699
	Medium educational level	4699	4699	4699	4699
	High educational level	4699	4699	4699	4699

Correlations

		Leeftijd op peildatum 1.9.2016	Male	SmokingYes	Low educational level
Pearson Correlation	REGR factor score 1 for analysis 1	-,028	,055	-,086	-,076
	Underweight	-,040	-,073	,033	-,009

	Overweight	,091	,131	-,017	,017
	Obese	,060	-,019	-,055	,094
	Leeftijd op peildatum 1.9.2016	1,000	,083	-,113	,274
	Male	,083	1,000	,044	-,056
	SmokingYes	-,113	,044	1,000	,009
	Low educational level	,274	-,056	,009	1,000
	Medium educational level	-,091	,007	,033	-,551
	High educational level	-,173	,055	-,052	-,300
Sig. (1-tailed)	REGR factor score 1 for analysis 1	,029	,000	,000	,000
	Underweight	,003	,000	,013	,274
	Overweight	,000	,000	,116	,127
	Obese	,000	,099	,000	,000
	Leeftijd op peildatum 1.9.2016	.	,000	,000	,000
	Male	,000	.	,001	,000
	SmokingYes	,000	,001	.	,259
	Low educational level	,000	,000	,259	.
	Medium educational level	,000	,324	,013	,000
	High educational level	,000	,000	,000	,000
N	REGR factor score 1 for analysis 1	4699	4699	4699	4699
	Underweight	4699	4699	4699	4699
	Overweight	4699	4699	4699	4699
	Obese	4699	4699	4699	4699
	Leeftijd op peildatum 1.9.2016	4699	4699	4699	4699
	Male	4699	4699	4699	4699
	SmokingYes	4699	4699	4699	4699
	Low educational level	4699	4699	4699	4699
	Medium educational level	4699	4699	4699	4699
	High educational level	4699	4699	4699	4699

Correlations

		Medium educational level	High educational level

Pearson Correlation	REGR factor score 1 for analysis 1	,013	,088
	Underweight	,016	-,012
	Overweight	,012	-,019
	Obese	-,003	-,092
	Leeftijd op peildatum 1.9.2016	-,091	-,173
	Male	,007	,055
	SmokingYes	,033	-,052
	Low educational level	-,551	-,300
	Medium educational level	1,000	-,569
	High educational level	-,569	1,000
Sig. (1-tailed)	REGR factor score 1 for analysis 1	,191	,000
	Underweight	,136	,212
	Overweight	,211	,096
	Obese	,406	,000
	Leeftijd op peildatum 1.9.2016	,000	,000
	Male	,324	,000
	SmokingYes	,013	,000
	Low educational level	,000	,000
	Medium educational level	.	,000
	High educational level	,000	.
N	REGR factor score 1 for analysis 1	4699	4699
	Underweight	4699	4699
	Overweight	4699	4699
	Obese	4699	4699
	Leeftijd op peildatum 1.9.2016	4699	4699
	Male	4699	4699
	SmokingYes	4699	4699
	Low educational level	4699	4699
	Medium educational level	4699	4699
	High educational level	4699	4699

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method

1	Obese, Underweight, Overweight[b]	.	Enter
2	Leeftijd op peildatum 1.9.2016[b]	.	Enter
3	Male[b]	.	Enter
4	SmokingYes[b]	.	Enter
5	Medium educational level, Low educational level, High educational level[b]	.	Enter

a. Dependent Variable: REGR factor score 1 for analysis 1

b. All requested variables entered.

Model Summary[f]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,075[a]	,006	,005	,99748696	,006	8,901
2	,079[b]	,006	,005	,99733617	,001	2,420
3	,097[c]	,009	,008	,99584916	,003	15,029
4	,136[d]	,019	,017	,99128936	,009	44,274
5	,172[e]	,030	,028	,98595718	,011	17,962

Model Summary[f]

Model	Change Statistics			
	df1	df2	Sig. F Change	
1	3	4695	,000	
2	1	4694	,120	
3	1	4693	,000	

4	1	4692	,000	
5	3	4689	,000	,017

a. Predictors: (Constant), Obese, Underweight, Overweight

b. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016

c. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male

d. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes

e. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes, Medium educational level, Low educational level, High educational level

f. Dependent Variable: REGR factor score 1 for analysis 1

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26,568	3	8,856	8,901	,000[b]
	Residual	4671,432	4695	,995		
	Total	4698,000	4698			
2	Regression	28,975	4	7,244	7,282	,000[c]
	Residual	4669,025	4694	,995		
	Total	4698,000	4698			
3	Regression	43,879	5	8,776	8,849	,000[d]
	Residual	4654,121	4693	,992		
	Total	4698,000	4698			
4	Regression	87,385	6	14,564	14,821	,000[e]
	Residual	4610,615	4692	,983		
	Total	4698,000	4698			
5	Regression	139,769	9	15,530	15,975	,000[f]
	Residual	4558,231	4689	,972		
	Total	4698,000	4698			

a. Dependent Variable: REGR factor score 1 for analysis 1

b. Predictors: (Constant), Obese, Underweight, Overweight

c. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016

d. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male

e. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes

f. Predictors: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes, Medium educational level, Low educational level, High educational level

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,048	,022		2,168	,030
	Underweight	-,132	,129	-,015	-1,025	,305
	Overweight	-,028	,032	-,014	-,870	,384
	Obese	-,210	,042	-,079	-5,021	,000
2	(Constant)	,129	,056		2,281	,023
	Underweight	-,136	,129	-,016	-1,060	,289
	Overweight	-,022	,032	-,011	-,682	,495
	Obese	-,203	,042	-,076	-4,848	,000
	Leeftijd op peildatum 1.9.2016	-,001	,001	-,023	-1,556	,120
3	(Constant)	,096	,057		1,683	,092
	Underweight	-,107	,129	-,012	-,834	,404
	Overweight	-,037	,033	-,018	-1,133	,257
	Obese	-,206	,042	-,077	-4,924	,000
	Leeftijd op peildatum 1.9.2016	-,002	,001	-,027	-1,817	,069
	Male	,114	,030	,057	3,877	,000
4	(Constant)	,174	,058		3,014	,003
	Underweight	-,085	,128	-,010	-,662	,508
	Overweight	-,044	,032	-,021	-1,341	,180
	Obese	-,221	,042	-,083	-5,297	,000
	Leeftijd op peildatum 1.9.2016	-,002	,001	-,037	-2,543	,011
	Male	,126	,029	,063	4,276	,000
	SmokingYes	-,277	,042	-,097	-6,654	,000
5	(Constant)	-,356	,106		-3,344	,001
	Underweight	-,075	,127	-,009	-,586	,558
	Overweight	-,039	,032	-,019	-1,200	,230

	Obese	-,195	,042	-,073	-4,669	,000
	Leeftijd op peildatum 1.9.2016	-,001	,001	-,011	-,743	,457
	Male	,106	,029	,053	3,605	,000
	SmokingYes	-,255	,042	-,090	-6,137	,000
	Low educational level	,320	,093	,134	3,448	,001
	Medium educational level	,224	,045	,224	4,983	,000
	High educational level	,187	,031	,239	6,054	,000

a. Dependent Variable: REGR factor score 1 for analysis 1

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	
1	Leeftijd op peildatum 1.9.2016	-,023[b]	-1,556	,120	-,023	
	Male	,055[b]	3,761	,000	,055	
	SmokingYes	-,090[b]	-6,200	,000	-,090	
	Low educational level	-,069[b]	-4,717	,000	-,069	
	Medium educational level	,013[b]	,884	,377	,013	
	High educational level	,081[b]	5,568	,000	,081	
2	Male	,057[c]	3,877	,000	,056	
	SmokingYes	-,094[c]	-6,404	,000	-,093	
	Low educational level	-,068[c]	-4,463	,000	-,065	
	Medium educational level	,011[c]	,743	,457	,011	
	High educational level	,080[c]	5,384	,000	,078	
3	SmokingYes	-,097[d]	-6,654	,000	-,097	
	Low educational level	-,063[d]	-4,160	,000	-,061	
	Medium educational level	,010[d]	,696	,487	,010	
	High educational level	,076[d]	5,120	,000	,075	
4	Low educational level	-,058[e]	-3,837	,000	-,056	
	Medium educational level	,012[e]	,847	,397	,012	
	High educational level	,068[e]	4,608	,000	,067	

Excluded Variables[a]

Model		Collinearity Statistics Tolerance
1	Leeftijd op peildatum 1.9.2016	,981
	Male	,978
	SmokingYes	,995
	Low educational level	,988
	Medium educational level	1,000
	High educational level	,988
2	Male	,974
	SmokingYes	,984
	Low educational level	,918
	Medium educational level	,991
	High educational level	,961
3	SmokingYes	,980
	Low educational level	,912
	Medium educational level	,991
	High educational level	,956
4	Low educational level	,909
	Medium educational level	,990
	High educational level	,950

a. Dependent Variable: REGR factor score 1 for analysis 1

b. Predictors in the Model: (Constant), Obese, Underweight, Overweight

c. Predictors in the Model: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016

d. Predictors in the Model: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male

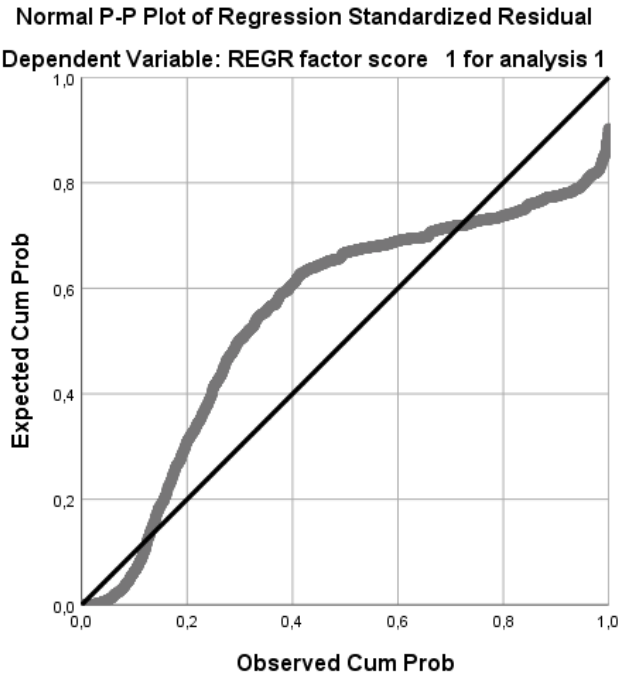
e. Predictors in the Model: (Constant), Obese, Underweight, Overweight, Leeftijd op peildatum 1.9.2016, Male, SmokingYes

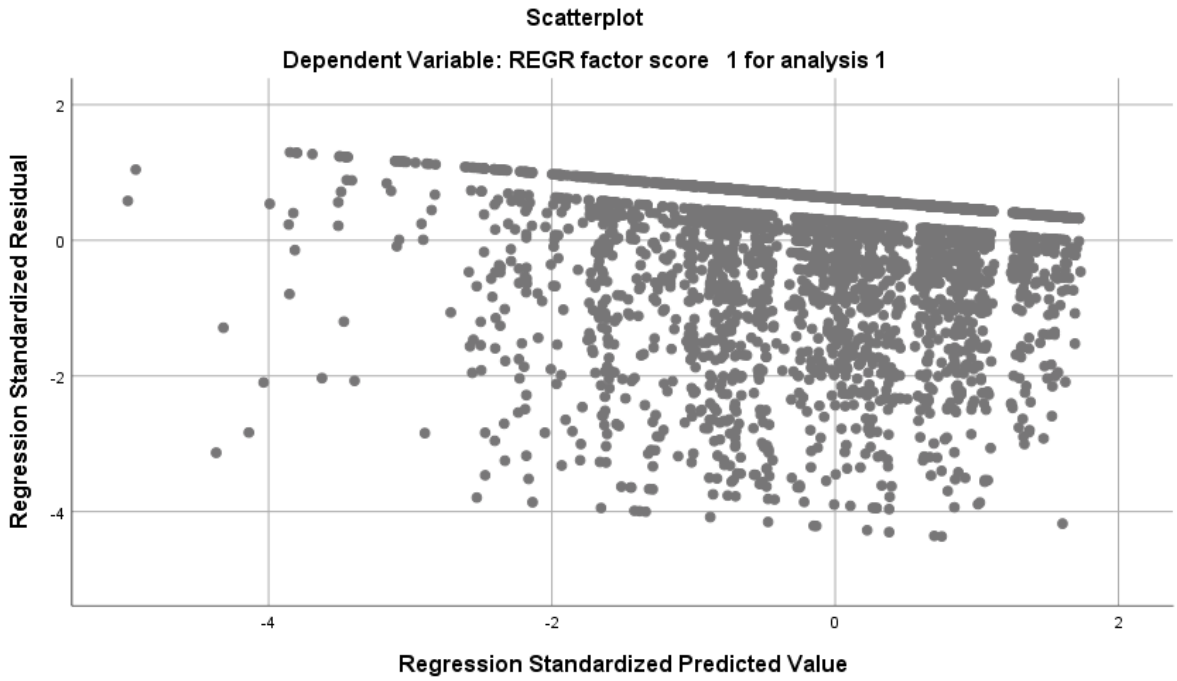
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-,8613161	,2988037	,0000000	,17248399	4699
Residual	-4,30602789	1,28008616	,00000000	,98501232	4699
Std. Predicted Value	-4,994	1,732	,000	1,000	4699
Std. Residual	-4,367	1,298	,000	,999	4699

a. Dependent Variable: REGR factor score 1 for analysis 1

Charts





*regression social domain.

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