‘St. KLIMENT OHRIDSKI’ UNIVERSITY
FACULTY OF PHILOSOPHY
DEPARTMENT OF GENERAL, EXPERIMENTAL, DEVELOPMENTAL AND HEALTH PSYCHOLOGY

‘PSYCHOSOCIAL CORRELATES OF OVERWEIGHT AND OBESITY’

ABSTRACT

This is to be awarded educational and scientific degree of ‘PhD’ in the scientific specialty: 3.2. Psychology (Health Psychology)

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The dissertation includes:

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Appendix: Research instruments

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The materials for the defence are available at the office of the Psychology department, Room 60, South Wing of Sofia University ‘St. Kliment Ohridski’, as well as on the university's website: www.uni-sofia.bg.

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RELEVANCE AND SIGNIFICANCE OF THE PROBLEM

Obesity is a major global health problem and has reached epidemic proportions in both developed and developing countries. According to the World Health Organization (WHO, 2021) the prevalence of overweight and obesity worldwide (based on BMI) reached 39% in 2016 (1.9 billion adults globally), of which 13% were obese (650 million individuals), with a higher prevalence in high-income countries (Ng et al., 2014). In the same year (2016), over 340 million children and adolescents aged 5 to 19 were overweight or obese (WHO).

The proportion of individuals with overweight has nearly tripled worldwide from 1975 to 2016 (same reference) **(Figure 1).**

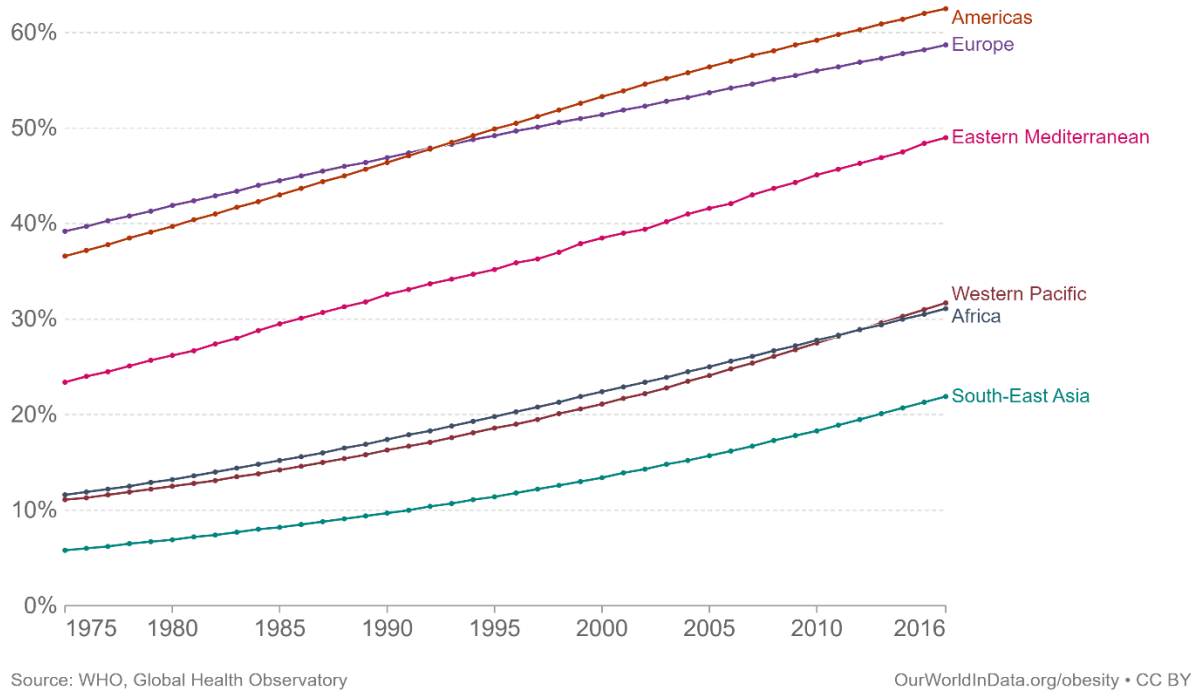

Figure 1: Prevalence of overweight or obesity in adults aged 18 and above from 1975 to 2016

A more detailed representation of the prevalence of overweight in Europe was published by Eurostat in 2019. The information is part of an online health statistics report and reflects the results from the third wave of the European Health Interview Survey (EHIS). Statistical data on the proportions of the population with overweight and obesity are presented for the European Union (EU), as well as for Norway, Serbia and Turkey. Weight-related issues and obesity are increasing at a rapid pace in most EU member states, with 51.3% of the adult population (aged 18 and above) being overweight. Published data are reflected in Table 1.

Table 1: Prevalence of overweight and obesity in Europe in 2019.

BMI	Underweight	Normal	Overweight	Obese	Overweight, including obesity
European Union	**2.9**	**45.8**	**35.2**	**16.0**	**51.3**
Belgium	3.2	48.0	32.9	15.9	48.8
Bulgaria	**2.4**	**44.1**	**40.2**	**13.2**	**53.4**
Czechia	1.6	40.0	39.1	19.3	58.4
Denmark	2.3	48.8	32.9	15.9	48.8
Germany	2.7	45.2	33.6	18.5	52.1
Estonia	2.5	42.4	34.0	21.1	55.1
Ireland	17.4	28.6	28.2	25.8	54.0
Greece	1.4	42.3	40.1	16.2	56.2
Spain	2.4	45.3	36.9	15.4	52.3
France	4.3	50.3	31.0	14.4	45.4
Croatia	1.7	34.5	41.2	22.6	63.8
Italy	3.9	51.4	33.2	11.4	44.7
Cyprus	3.9	47.7	33.8	14.6	48.5
Latvia	2.6	40.7	34.4	22.3	56.7
Lithuania	2.3	42.7	36.7	18.3	55.0
Luxembourg	3.7	49.2	31.0	16.1	47.1
Hungary	2.7	38.9	34.5	23.9	58.3
Malta	1.9	34.2	35.7	28.1	63.9
Netherlands	2.9	48.9	34.2	14.1	48.3
Austria	2.6	46.3	34.4	16.7	51.1
Poland	2.7	40.6	38.2	18.5	56.7
Portugal	2.0	43.4	37.3	17.2	54.5
Romania	1.0	42.5	46.0	10.5	56.4
Slovenia	1.6	41.8	37.3	19.4	56.6
Slovakia	2.2	40.0	38.5	19.3	57.8
Finland	1.7	40.6	37.3	20.3	57.7
Sweden	2.4	48.0	35.0	14.7	49.6
Iceland	1.4	38.5	38.4	21.7	60.1
Norway	2.0	48.4	35.7	13.8	49.6
United Kingdom	:	:	:	:	:
Serbia	2.3	45.2	35.6	16.8	52.4
Turkey	3.8	40.1	35.0	21.1	56.1

Source: Eurostat statistics (europa.eu)

Bulgaria is not an exception to the general trend of increasing overweight and obesity among the population. Graphically represented (**Figure 2**), the generalized data from studies conducted from 1998 to 2019 in Bulgaria are as follows:

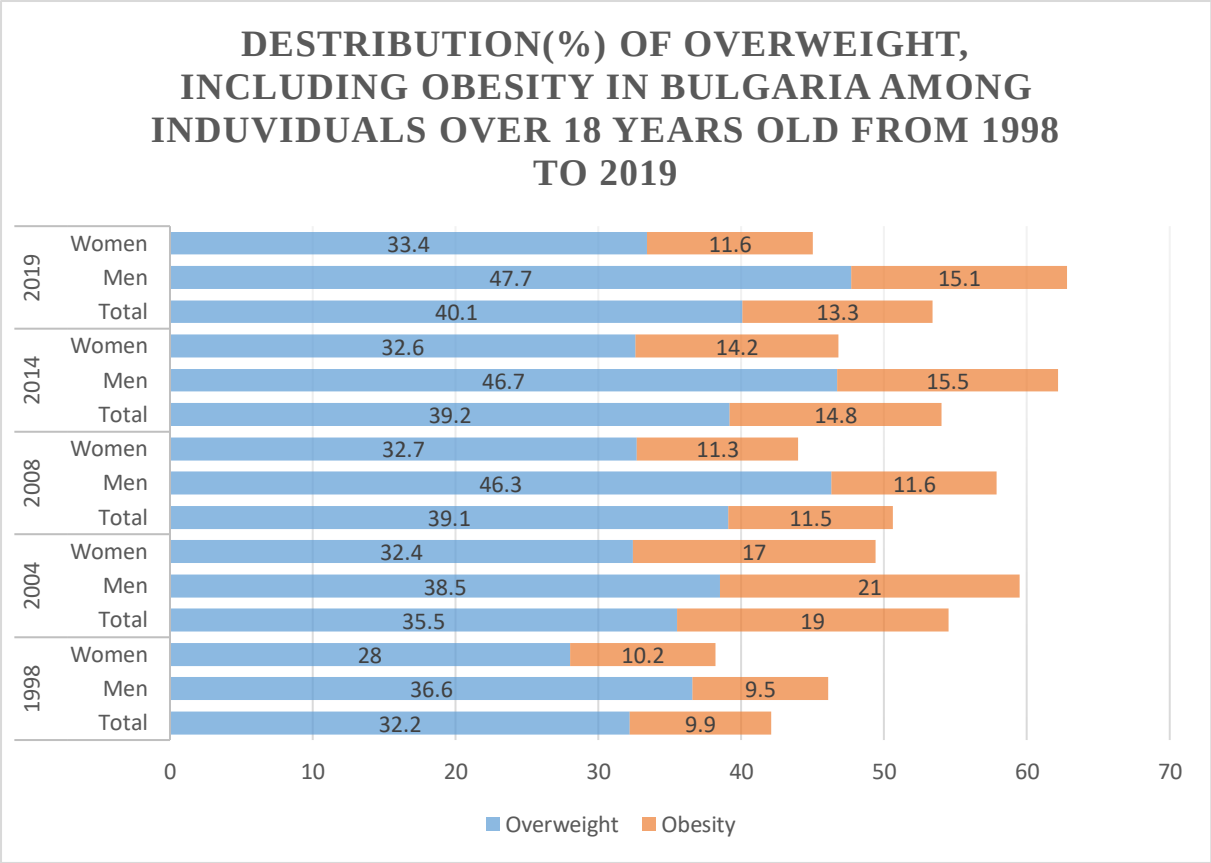

Figure 2: Distribution (%) of overweight, including obesity in Bulgaria among individuals over 18 years old from 1998 to 2019.

The presented information includes data from two national surveys conducted in 1998 and 2011 (Petrova, 2012), as well as newer data on the topic provided by the three waves (2008, 2014, 2019) of the European Health Interview Survey conducted within the framework of the European System of Health Surveys (NSI). In terms of the time perspective, there is an evident increase in the prevalence of overweight individuals, including those with obesity in the Bulgarian population. In 1998, they accounted for 42.1%, while in 2019, 62.8% of men and 45.0% of women over 18 years old were above the healthy weight range, which, on average, is slightly over half of the adult population in the country (53.4%).

After 2019, there is a lack of a more comprehensive and generalized database on the prevalence of overweight and obesity. Information on trends in this regard is only available for children under the age of 5. As of 2020, 39 million children in this age group were overweight or obese (WHO).

Data reported in various studies over the past three years (2020/2022) indicate that the prevalence of overweight and obesity continues to increase both as a percentage of the population and geographically. For example, information published by the U.S. Department of Health (Stierman, 2021) indicates that in 2020, 41.9% of the U.S. population had obesity (the statistics do not include overweight individuals). According to the latest report from the World Health Organization (WHO, 2022), around 60% of people residing in the European region of the organization are overweight or obese.

Overweight and obesity are major global health problems (Żukiewicz-Sobczak, 2014). Evidence suggests that they are significant risk factors for a range of non-communicable diseases, including cardiovascular diseases (coronary heart disease, heart failure, hypertension, atherosclerosis) (Ebbert et al., 2014; Ramel et al., 2009), endocrine diseases (type 2 diabetes) (Reaven, 2011), musculoskeletal disorders (osteoarthritis, rheumatoid

arthritis) (Hoffmann et al., 2015; Alvarez-Nemegyei et al., 2020), respiratory diseases (sleep apnea, asthma) (Peters et al., 2019), neurological disorders (stroke, migraine) (Emerenziani et al., 2019), renal diseases (chronic kidney disease) (Betzeler et al., 2021), and reproductive disorders (uterine fibroids) (Qin et al., 2021).

In addition to the physical health risks, overweight and obesity have negative impacts on social functioning and mental health (Puhl et al., 2007; Scott et al., 2008; Rogowski, 2012; Verstuyf et al., 2012; Flint et al., 2016; Rajan & Menon, 2017; Amiri & Behnezhad, 2019; Zhou et al., 2020; Rubino et al., 2020; Zeiler et al., 2021; Spyreli et al., 2022).

The presented information outlines a concerning trend. On one hand, the prevalence of overweight and obesity in contemporary society is very high and is becoming more of a norm than an exception. On the other hand, overweight and obesity are serious conditions associated with various physical illnesses and risks to mental and social functioning. These observations have motivated researchers from different fields of science for several decades to theorize and study the problem. This dissertation provides an overview of psychological theories and research on the topic and tests hypotheses generated from these perspectives. A series of psychometric analyses have been conducted to examine the interrelationships between the psychosocial correlates of eating behavior, physical activity and overweight.

GENERAL CHARACTERISTICS OF THE DISSERTATION

Overweight and obesity are multi-component phenomena with genetic, biological, psychological, socio-economic, and behavioral correlates. At their core is an energy imbalance between caloric intake and expenditure. From this perspective, diet and levels of physical activity are key behavioral factors that play a crucial role in maintaining weight within healthy boundaries (So et al., 2017; Myers et al., 2017; Grgic et al., 2018; Eng et al., 2020).

Depending on the theoretical perspective, different potential factors with psychological, social and environmental characteristics are emphasized, which influence the formation of eating behavior, daily dietary choices, and engagement in physical activity. A better understanding of these correlates is crucial for planning and implementing interventions for public health prevention and developing effective therapeutic programs to address the problem.

The theoretical aim of this study is to demonstrate how theoretical thinking related to overweight and obesity has evolved over the years and how each subsequent theory builds upon and enriches the previous ones, driven by critical thinking, research seeking evidence, and socio-cultural changes. The perspectives of different psychological theories and the knowledge derived from conducted studies on the topic have been proposed and systematized.

At the core of the conceptual framework of the dissertation's theoretical-empirical study are the ideas of the Ecological Model of the multi-component nature of overweight and obesity. This paradigm attempts to integrate individual and social behavior with determinants of the environment (Sallis & Owen, 2008). From the perspective of this multifactorial model, the focus of this work is placed on the interrelationships and interactive influence of psychological and social correlates on eating behavior, physical activity, and body weight.

In operationalizing the main variables, the determinants derived from various theoretical perspectives related to eating behavior, physical activity, overweight, and obesity have been taken into account. The theoretical-empirical model advocated in the study is presented in **Figure 3** (page 11).

The aim of this dissertation is the theoretical and empirical examination of the relationships and degree of interaction between eating behavior, physical activity and overweight/obesity, taking into account the effects of psychosocial correlates.

To achieve the goals and objectives of this study, a methodology has been proposed for investigating the phenomena under study. Following a review of Bulgarian and foreign scientific literature, scales have been selected to operationalize the psychological correlates related to eating behavior, physical activity and weight. New quantitative scales have been constructed to operationalize factors from the surrounding environment, the positive influence of which has been established by previous studies (Popkin et al., 2012; Sallis et al., 2012; Jia & Fu, 2014; Micha et al., 2018; Melian-Fleitas et al., 2021; Pineda, 2021). The results of the analysis of the psychometric characteristics of the instruments used are satisfactory, allowing their use for academic purposes.

The results of the conducted study are oriented towards expanding empirical knowledge, as well as improving preventive, consultative and psychotherapeutic practices related to overweight and obesity.

STRUCTURE AND CONTENT OF THE DISSERTATION

The dissertation text is structured into an introduction, three chapters, and a conclusion. Following the main text, there are references to the literature used and an appendix containing the research methodology. The **first chapter** begins with key definitions on the topic and statistical data on the prevalence of overweight and obesity worldwide, in Europe, and in Bulgaria. Information is presented on the health consequences related to overweight and obesity, which justify the relevance and significance of the researched issue.

The theoretical presentation starts with a broader field of general research models on eating behavior (Ch. I, section 4.3), where three approaches are described. **The developmental approach** emphasizes the importance *of **family and close environment*** (Birch & Fisher, 2000; Osera et al., 2012; Grammer et al., 2022). Several learning principles are noted - exposure, modeling, imitation, observational learning - which contribute to the formation of eating behavior and highlight the role of the family in developing healthy/unhealthy dietary habits. **Socio-cognitive approaches** focus on individuals' cognitions, their influence and their ability to predict and explain health behavior. This introduces the role of *beliefs* (Rosenstock, 1974; Wamsteker et al., 2005; Wang & Coups, 2010; Ashton et al., 2017; Zewdie et al., 2020) and ***self-efficacy*** (Wamsteker et al., 2005; Darkre et al., 2010; Hardcastle et al., 2015; Efthymiou et al., 2021). **The ecological approach** broadly assumes three main influences on food choice: 1) biological factors such as genetic predisposition, age, gender, hormonal factors; 2) behavioral influences resulting from the interaction of habits, beliefs, cognitions, emotions; and 3) macro- and micro-environmental influences (Sallis & Owen, 2008; Karabeliova, 2017). This model includes the impact of ***contextual factors***. The theorized and researched correlates of behavior from these theoretical approaches can either support or undermine healthy eating habits and physical activity, which, in turn, can influence weight.

The next part of the theoretical exposition is dedicated to theoretical views related to overweight and obesity (Ch. I, section 5). It sequentially introduces the theoretical thinking of the past 70 years related to the psychosocial etiology of the condition. Some of the main theoretical frameworks linking overweight and obesity with various correlates are presented.

The psychosomatic theory (Bruch, 1961, 1975; van Strien, 1986) emphasizes the influence of ***negative affective states*** (Scott et al., 2008; Zhao et al., 2020; Cecchetto et al., 2021; Eik-Nes et al., 2022), suggesting that eating behavior is a strategy for emotional

regulation (Ganley, 1989; Lazarevich et al., 2016). **The external cue theory** (Schachter, 1971) explains overweight and obesity as a result of excessive ***food consumption stimulated by sensory and hedonistic food cues*** (Coelho et al., 2009; Zoon et al., 2014; Boswell & Kober, 2016; Steenhuis & Poelman, 2017). **The cognitive restraint theory** (Harman & Mack, 1975; Nisbett, 1972; Polivy et al., 1985) suggests that weight gain is stimulated by ***disinhibited dietary control***, leading to uncontrolled and excessive eating. **The spiral model** of overweight and obesity (Heatherton & Polivy, 1992) introduces ***body dissatisfaction*** as a central component associated with these conditions (Makara-Studzinska & Zaborska, 2009; Runfola et al., 2013; Weinberger et al., 2016; Gioia, 2022; Kataria et al., 2022). The predictive role of ***stress*** is introduced by the **Stress-Response Model** (Adam & Epel, 2007), which states that increased stress levels in contemporary society lead to changes in eating behavior and the consumption of high-energy foods, resulting in weight gain (Dallman, 2010; Holt et al., 2015; Pagliai et al., 2021; Malik & Hu, 2022). **The homeostatic theory** (Marks, 2015) integrates knowledge of psychological and social correlates, justifying overweight and obesity with a circular causality involving four phenomena: ***body dissatisfaction, negative affective states, excessive eating, overweight and obesity*** (Markey, 2016). **The ecological model** of overweight and obesity (Sallis & Owen, 2008) could be accepted as an integrative theoretical framework, bringing together individual and psychological characteristics (theorized and investigated by previous models), interpersonal social interactions (derived from developmental approaches, behavior learning mechanisms, social learning, and social-cognitive theories), and adding ***environmental obesogenic influences*** distributed across three levels: ***organizational level*** (Stewart, 2009; Micha et al., 2018; Pineda, 2021; Melian-Fleitas et al., 2021), ***physical level*** (Powell et al., 2003; Saelens et al., 2003; Mohammed et al., 2019) ***and policies*** (Van Stappen et al., 2018).

Chapter 2 presents the organizational framework of the empirical study. The objectives and tasks are outlined, along with the main research hypotheses. Additionally, this section describes the procedure for conducting the study, provides information about the research instruments used and introduces the respondents involved in the research.

In Chapter 3 the obtained results are analyzed and discussed. In accordance with the objectives and in order to test the raised hypotheses, a series of analyses are conducted, including variance analyses (Chapter III, section 2.2 / section 2.2.1; 2.2.2; 2.2.3), correlation analyses (Chapter III, section 2.3), and regression analyses (Chapter III, section 2.4; 2.5). Due to the volume of work and for the sake of clarity, each paragraph presents the results of the analyses and the corresponding discussion. The results are discussed based on the raised hypotheses, the introduced theoretical perspectives and previous studies.

FORMULATION AND ORGANIZATION OF THE EMPIRICAL STUDY

4.1. Justification of the empirical study

The empirical study in this research is situated and constructed within the framework of the Ecological Approach to the investigation of overweight and obesity. Based on the analysis of the research literature on the topic, the proposed theoretical and research model incorporates multiple factors (variables) that directly or indirectly influence eating behavior and physical activity, as key components (at the behavioral level) associated with weight gain. Graphically represented, the applied theoretical model of the study is presented in **Figure 3.**

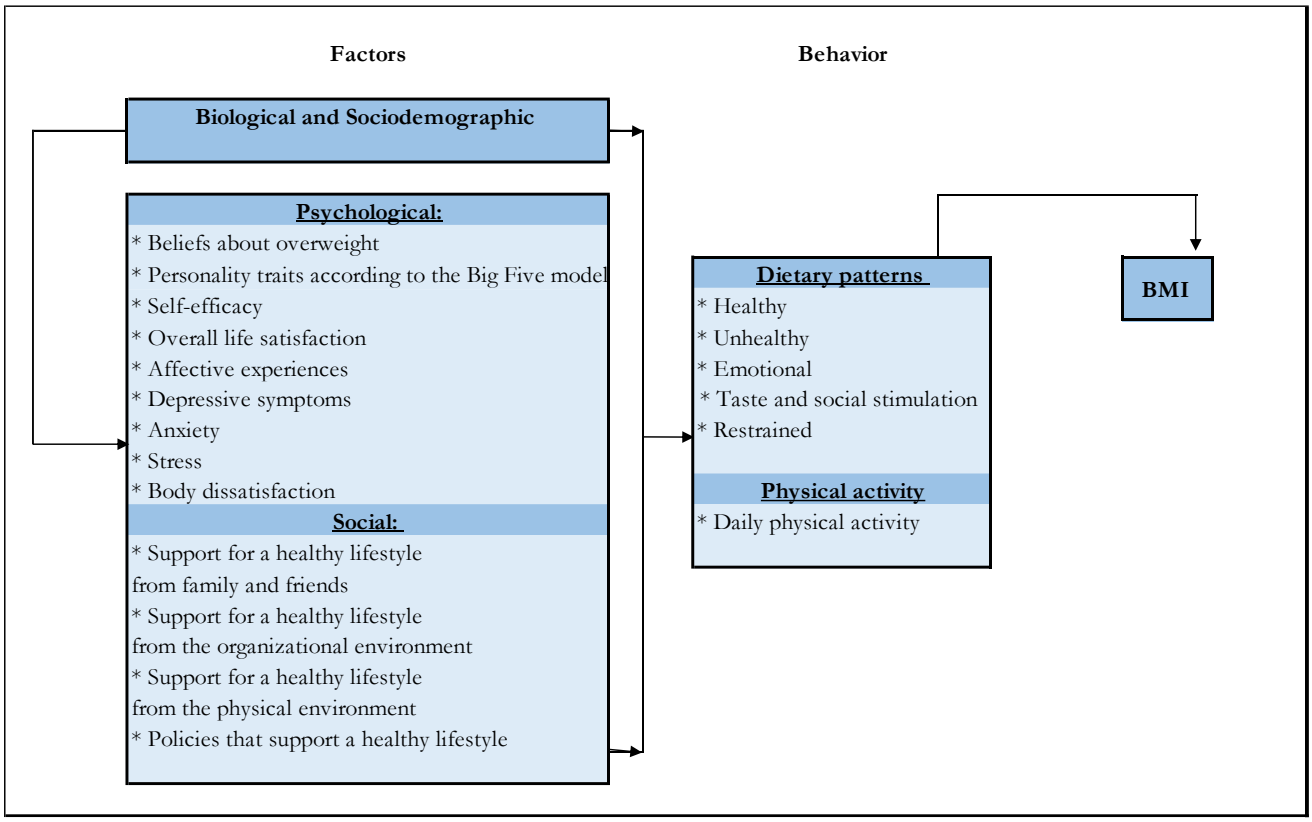

Figure 3: Theoretical model for studying the psychosocial correlates of overweight and obesity

This model will examine the relationships between psychological, social and environmental (obesogenic) factors, patterns of eating behavior and physical activity, which in turn may have an effect on BMI. Additionally, the proposed model can validate the effect of BMI on psychosocial factors.

4.2. Objective, tasks and hypotheses of the study

The objective of this study is to investigate the relationships and degree of interaction between eating behavior, physical activity and overweight/obesity, taking into account the effects of psychosocial correlates.

The following **hypotheses** have been raised to achieve the objective:

The first hypothesis is related to the effect of sociodemographic characteristics on eating behaviors and physical activity. In this perspective, we expect that gender, age, educational level, place of residence, marital status, financial status, and health status will differentiate orientations towards eating behaviors and physical activity. We assume that emotional and restrictive eating will be more prevalent among women and older individuals. Additionally, we anticipate that men, older individuals, those with lower educational attainment, residing in rural areas, having lower monthly incomes, and with chronic illnesses, will exhibit a stronger orientation towards unhealthy eating behaviours. We also expect that men and younger individuals will be more engaged in higher levels of physical activity compared to others.

The second hypothesis pertains to the relationship between eating behaviors and physical activity with body weight. We hypothesize that differences will emerge based on

body weight status (underweight, normal weight, overweight, obesity, classified according to BMI standards). Additionally, we assume that individuals with overweight and obesity will exhibit unhealthier eating patterns, higher levels of emotional eating, as well as eating driven by taste characteristics of food and/or social context. Furthermore, we expect these respondents to have lower levels of physical activity compared to individuals with underweight and normal weight.

The third hypothesis is related to studying the effect of body weight on psychological, social, and environmental (obesogenic) correlates. We hypothesize that body weight status (underweight, normal weight, overweight, obesity, classified according to BMI standards) will significantly differentiate psychological, social, and environmental factors. We anticipate that individuals with overweight and obesity will demonstrate higher levels of negative affective experiences and body dissatisfaction, as well as lower levels of beliefs regarding controllability of their condition and overall life satisfaction. Additionally, we expect that respondents with above-normal weight will have lower levels of social support.

The fourth hypothesis pertains to the relationship of psychological, social, and environmental (obesogenic) correlates with eating behaviors and physical activity. Specifically, we expect that personality traits such as 'Conscientiousness' and 'Self-efficacy' will be positively associated with healthy eating, while unhealthy and emotional eating will be positively linked to neuroticism as a personality trait, higher levels of depressive symptoms, anxiety, stress, negative emotions, and lower levels of overall life satisfaction. Additionally, we assume that eating stimulated by external cues such as taste characteristics of food or social context will be negatively associated with the personality trait of 'Conscientiousness' and the support for a healthy lifestyle from family, friends, and environmental (obesogenic) factors. Furthermore, we anticipate a positive interaction between restrained eating and beliefs about the seriousness of overweight and obesity, self-efficacy, body dissatisfaction, as well as a negative association with perceived controllability of the condition. Regarding physical activity, we expect a positive relationship with the support for a healthy lifestyle from family and friends, as well as supportive factors from organizational, physical, and policy environments aimed at promoting a healthy lifestyle. Overall, we hypothesize that psychological, social, and environmental (obesogenic) factors will have a significant effect on eating behaviors and physical activity.

The fifth hypothesis relates to the effect of eating behaviors and physical activity on the body mass index (BMI). We assume that patterns of eating behavior and physical activity will have a significant effect on body weight. In this regard, we posit that unhealthy eating, emotional eating, eating prompted by taste characteristics of food and/or social context will have a significant effect and contribute to overweight. Regarding physical activity, we expect it to lead to a reduction in overweight.

To test the raised hypotheses, the following tasks have been set for resolution:

- Verify the structural organization of the questionnaires and scales used.
- Determine the differentiating effect of sociodemographic characteristics on eating behaviors and physical activity.
- Identify the differentiating effect of BMI on eating behavior, physical activity, psychological, social, and environmental (obesogenic) factors.
- Test and establish the correlations between the investigated phenomena.
- Determine the effects of psychological, social, and environmental (obesogenic) correlates on eating behavior and physical activity.
- Examine the relationship between eating behaviors, physical activity, and body weight.

4.3. Research instruments

- **Questionnaire on Eating Behavior and Physical Activity** (Pandurova & Karabeliova, 2022)

The questionnaire was created for the purposes of this study. It consists of 24 statements, based on a preliminary literature review and recommendations from experts in the field of nutrition (Chapter I, Section 4.2). The included items are divided into three scales, reflecting tendencies toward: healthy eating, unhealthy eating, and physical activity. The scale is of the Likert type, with five possible response options: '1-Very rarely or never,' '2-Rarely,' '3-Sometimes,' '4-Often,' '5-Very often or always.'

The 'Healthy Eating' scale is designed to assess the tendency toward consuming foods and dietary patterns associated with positive health effects and maintaining weight within healthy limits. The scale includes 11 statements such as, 'My daily menu includes balanced and diverse food,' 'Throughout the day, I have 3 to 5 meals (3 main meals and 2 light snacks),' 'I eat fresh and diverse fruit every day,' 'I eat fresh or cooked vegetables every day,' and so on. The total score of the scale ranges from 11 to 55, with higher scores indicating a stronger tendency toward healthy eating.

The 'Unhealthy Eating' scale consists of 8 statements such as 'I eat fatty meat (pork, beef, etc.)', 'I consume fast food or junk food, like kebabs, burgers, sandwiches, pizza slices, pastries, snacks, etc.', 'I eat sweets, desserts, candies, cakes', 'I eat fried and/or breaded food'. These statements reflect a tendency towards food choices and consumption associated with health risks and weight gain. The scale ranges from 8 to 40, with higher scores indicating a stronger tendency towards unhealthy eating. The statements are positively formulated, meaning that as the score increases, the tendency towards unhealthy eating also increases.

The 'Physical Activity' scale includes five statements that assess the participants' routine physical activity (e.g., 'I walk every day'). The scale ranges from 5 to 25 and is derived by summing up the scores of the five items, with four of them positively formulated and one negatively formulated. Higher values indicate a tendency towards physical activity, while lower values indicate a sedentary lifestyle.

- **The Beliefs about Overweight Questionnaire (Wamsteker et al., 2005)**

It was translated and adapted for the Bulgarian socio-cultural context in 2020 when it was used within the project titled 'Overweight - a factor for well-being/misfortune' at Sofia University, Department of General, Experimental, Developmental, and Health Psychology (Karabeliova, 2020/2021; Spasevska et al., 2021; Karabeliova et al., 2022). It consists of 20 statements, rated on a 5-point Likert scale ranging from '1 - Strongly disagree' to '5 - Strongly agree'. The items are divided into four scales that assess beliefs about:

'Seriousness of the condition'- a high score reflects participants' beliefs that overweight is a condition associated with serious consequences.

'Duration of the condition' - a high score on the temporal scale reflects respondents' belief that overweight is a stable characteristic.

'Psychological factors of the condition' - a high score reflects participants' beliefs that overweight is related to psychological factors.

'Controllability of the condition' - high scores on this dimension reflect the beliefs of the participants that overweight is not under personal and behavioral control.

- **The Dutch Questionnaire of Eating Behavior** (DEBQ, van Strien et al., 1986) it is an internationally recognized tool for assessing eating styles. It is a practical and useful research instrument as it operationalizes three of the main theoretical models (described in Chapter I, sections 5.1, 5.2, 5.3) related to overweight and obesity. The questionnaire consists

of 33 statements distributed across three scales that measure emotional eating, restrained eating, and external eating. The rating scale is a five-point Likert-type scale, ranging from '1 – Never' to '5 - Very often'.

The 'Emotional Eating' scale includes 13 items that reflect the tendency to eat in response to negative emotions. For example: 'Do you have cravings to eat when you are angry?', 'Do you have the desire to eat when you are anxious, worried, or tense?', etc. The scoring range is from 13 to 65, with higher scores indicating a higher engagement in emotional eating.

The 'Taste and Social Stimulation' scale consists of 10 items that indicate a tendency to eat not driven by physiological signals of hunger and satiety but rather by external stimuli associated with food. Example questions include: 'Do you eat more than usual when the food is tasty?', 'If the food looks or smells good, do you eat more than usual?', 'If someone else is eating, do you feel like eating too?', 'When you pass by a bakery, do you have the desire to buy something delicious?', etc. The scoring range for this scale is from 10 to 50, with higher scores reflecting a higher inclination toward externally stimulated eating.

The 'Restrained Eating' scale is associated with cognitively driven food restriction. It consists of 10 items such as: 'If you have gained weight, do you eat less than usual?', 'How often do you refuse offered foods or drinks because you are concerned about your weight?', 'Do you intentionally consume food that helps you lose weight?', etc. Once again, higher scores indicate a higher tendency for cognitive control over eating.

- **Generalized Self-Efficacy Questionnaire** (Schwarzer & Born, 1997; Stamova et al., 1993). In the present study, the revised version of the Generalized Self-Efficacy Questionnaire was used. The scale consists of 10 positively formulated statements that are rated on a 4-point Likert scale ('1-Completely untrue'; '2-Rather untrue'; '3-Rather true'; '4-Completely true'). The adapted Bulgarian version of the questionnaire (Stamova, Schwarzer, Jerusalem, 1993) was used for this study, which has shown good psychometric properties (α=0.837).

- **Scale of Positive and Negative Experience** (SPANE, Diener et al., 2010; Zankova, 2015). The scale is designed to assess the emotional component of subjective well-being, considering positive and negative affects as two distinct dimensions of subjective well-being. For the purposes of the study, the adapted and standardized version for the Bulgarian socio-cultural context (Zankova, 2015) was used. The scale consists of 12 statements, with 6 of them reflecting positive emotions (e.g., Positive', 'Joyful') and the remaining ones reflecting negative emotions (e.g., 'Angry', 'Afraid'). Each emotion is rated on a 5-point Likert scale as follows: '1 - Never or very rarely', '2 – Rarely', '3 – Sometimes', '4 – Often', '5 - Very often or always'.

- **Depression, Anxiety and Stress Scale** (DASS-21, Lovibond & Lovibond, 1995; Ivanova, Mitev & Karabeliova, 2016). The scale measures negative emotional states related to depression, anxiety, and stress. The original questionnaire was developed by Lovibond and consists of a total of 42 items. The shortened version used in the current study was published by the authors in 1995. It consists of three scales with 7 items each, associated with the symptoms of the respective condition. The depression scale includes statements related to feelings of hopelessness, anhedonia, and apathy (e.g., '...I don't experience any positive feelings', '...I feel that life is meaningless', etc.). Anxiety relates to feelings of fear, panic, and tension (e.g., '...I feel scared for no reason'). The stress scale describes states of chronic nervous arousal and irritability (e.g., '...I feel quite irritable', etc.). Respondents rate each item using a Likert-type scale ranging from 1 to 4, as follows: '1-Does not apply to me at all', '2-Applies to me to some degree, or some of the time', '3-Definitely applies to me to a

considerable degree, or a good part of the time', '4-Definitely applies to me very much, or most of the time'. The instrument has been adapted for various cultures and has been used in numerous studies, with its validity and reliability being repeatedly confirmed. For the Bulgarian socio-cultural context, the questionnaire was adapted and standardized by S. Karabeliova and colleagues (Ivanova, Mitev & Karabeliova, 2016).

- **Brief version of the personality traits questionnaire** (BFI, John & Srivastava, 1999; Stoyanova & Karabeliova, 2020).

The questionnaire for studying personality traits was developed by P. John and S. Srivastava. It operationalizes the model of the 'Big Five' (Goldberg, 1993), which includes five dimensions: 'Extraversion,' 'Agreeableness,' 'Conscientiousness,' 'Neuroticism,' and 'Openness.' For the purposes of this study, a brief version of the questionnaire was used, consisting of 15 items distributed across three items within each of the five scales of the model. The items were evaluated on a 5-point Likert scale, ranging from '1-Strongly Disagree' to '5-Strongly Agree.' This revised version was developed in 2020 (Stoyanova and Karabeliova, 2020) and includes selected items with high factor loadings derived from the adaptation and standardization of the questionnaire for the Bulgarian socio-cultural context (Stoyanova and Karabeliova, 2019).

- **Analog scale for ranking silhouettes** (Thompson & Gray, 1995):

Dissatisfaction with one's own body is studied using the 'Analog Scale for Ranking Silhouettes,' which includes a series of 9 female and 9 male figures varying in body size. This research tool is based on the theory of Self-Discrepancy, where it is believed that dissatisfaction with one's own body is a function of the mismatch between the actual self and the ideal self. The intensity of body dissatisfaction depends on the degree of discrepancy. Participants are instructed to complete two statements: 1) 'I believe my figure most closely resembles number...'; 2) 'I would like to look at least like number..., 'linking their choice to the corresponding number under the selected silhouette.

- **Questionnaire for social support of a healthy lifestyle** (Pandurova & Karabeliova, 2022):

The questionnaire was developed for the purposes of a dissertation study. It is constructed as a two-dimensional instrument measuring social support for a healthy lifestyle. The statements included in the questionnaire are organized into two scales: "Family support for a healthy lifestyle" and "Friend support for a healthy lifestyle." It consists of 12 paired statements that respondents use to assess perceived social support. The rating scale is a 5-point Likert-type scale, with its two endpoints reflecting opposite tendencies: support for and barriers to a healthy lifestyle.

The scale ***'Family support for a healthy lifestyle'*** includes 7 statements assessing support for healthy eating (e.g., 'In my home, we eat healthily' versus 'At home, we eat unhealthy food') and physical activity ('Physical activity and sports are important for my family (part of family values and culture)'versus 'Physical activity and sports are not important for my family').

'Friend support for a healthy lifestyle' is the other dimension being investigated and forms the second scale. It consists of 5 statements reflecting the perception of the respondents regarding support for healthy eating ('My friends consider healthy eating important' versus 'My friends minimize the importance of healthy eating') and physical activity ('I can easily find company for sports or other forms of physical activity among my friends' versus 'Among my friends, it is difficult to find company for sports or other forms of physical activity').

- **Questionnaire for supporting a healthy lifestyle from the environment** (Pandurova & Karabeliova, 2022)

The questionnaire integrates factors from the three external (contextual) spheres of influence according to the ecological model (Figure 7). It consists of 19 statements distributed across three scales and evaluated on a 5-point Likert scale: '1-Strongly Disagree,' '2-Disagree,' '3-Neutral,' '4-Agree,' '5-Strongly Agree.'

The 'Support for Healthy Lifestyle from the Organizational Environment' scale measures the support for healthy eating and physical activity provided by schools or employers. The scale includes 5 statements (e.g., 'There is a dedicated space for physical activity (fitness room, sports hall) at my workplace/school with free and unrestricted access for everyone,' 'Healthy food options are available at my workplace/school'). The questions are positively formulated, and the highest score on this scale is 25. As the score increases, the tendency for support from the organizational environment also increases.

The 'Support for Healthy Lifestyle from the Physical Environment' scale is designed to assess factors in the immediate physical environment associated with maintaining a healthy weight. There are 7 positively formulated statements in this scale, including items such as 'There are sports facilities with free access near my home,' 'There is a market near my home where I can buy fresh fruits and vegetables,' 'There are gardens and parks near my home where I can take a walk,' and so on. The scale ranges from 7 to 35, and as the score increases, the tendency for the environment to provide support for healthy eating and physical activity also increases.

The 'Policies Supporting a Healthy Lifestyle' scale consists of 7 statements, such as 'I can walk or bike safely in my area,' 'I can purchase healthy and diverse food at an affordable price (fruit, vegetables, fish, organic products, etc.),'and so on. One of the questions in this scale is negatively phrased: 'Unhealthy food and drinks are frequently advertised on national and licensed television channels.' The scale ranges from 7 to 35, and as the score increases, it indicates a tendency for support through indirectly stimulating healthy behaviour.

- ***Scale for measuring overall life satisfaction*** (SWLS, Pavot & Diener, 1993; Ivanova, 2011).

The scale assesses the subjective perception of global satisfaction, reflecting the cognitive aspects of subjective well-being. It consists of 5 statements evaluated on a 5-point scale (ranging from '1-Strongly Disagree' to '5-Strongly Agree'). The instrument demonstrates good validity and reliability, as well as result stability across cultural contexts. The scale has been adapted and standardized for the Bulgarian sociocultural context (Ivanova, 2011).

4.4. Respondents

The study includes **712 participants**, with a majority of females (84.3%), while males account for 15.7% of the respondents. The participants' ages range from 16 to 76 years (M = 40.24; SD = 14.577), distributed into four groups for analysis purposes: 16-21 years (14%), 22-35 years (21.8%), 36-50 years (37.8%), and 41-76 years (26.1%). Regarding weight, BMI ranges from 13.4 to 48.8 (M = 28.318; SD = 7.2957). The participants are classified into groups based on BMI standards: underweight (4.9%), normal weight (31.6%), overweight (25.0%), and obesity (38.5%). In terms of marital status, the respondents are divided into two groups: married (62.2%) and unmarried (37.8%). Regarding place of residence, 40.2% of the participants reside in the capital city, 32.0% in a large city, and 27.8% in a small town or village. In terms of educational attainment, the participants are divided into two groups, with a higher percentage having a higher education degree (67.4%) compared to those with a

secondary education degree (37.8%). To determine economic status, participants were asked about their monthly income, resulting in four groups: up to 600 BGN (21.2%), 601 to 1000 BGN (24.2%), 1001 to 1500 BGN (26.3%), and above 1501 BGN (28.4%). In the current study, participants who do not engage in sports dominate (46.8%), while 28.7% reported engaging in sports 1-2 times a week, 18.4% 3-4 times a week, and 6.2% engage in sports daily. Regarding health status, the majority of respondents (68.8%) reported no chronic illnesses, while 31.2% reported having chronic illnesses.

5. Psychometric characteristics and structural organization of the used instruments

As a preliminary measure to assess the suitability of the data for latent variable analysis, two statistical procedures were conducted: The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and the Bartlett's Test of Sphericity. The KMO measure of sampling adequacy for all scales used exceeds the recommended value of 0.60 (Ganeva, 2016) and ranges from 0.719 to 0.918. The results for each scale are presented in *Table 2:*

Table 2: KMO of the scales used in the study

Questionnaire		KMO
1.	Questionnaire on eating behavior and physical activity (Pandurova & Karabeliova,2022)	0,831
2.	Questionnaire on beliefs about overweight (Wamsteker, E., et al. 2005)	0,715
3.	Dutch Eating Behavior Questionnaire (van Strien, et. al., 1986)	0,933
4.	General Self-Efficacy Scale (Schwarzer, Bornq 1997)	0,934
5.	Scale of Positive and Negative Experiences (Diener et al., 2010)	0,934
6.	Depression, Anxiety, and Stress Scale (Lovibond & Lovibond, 1995)	0,924
7.	Short version of the Big Five Inventory (John & Srivastava, 1999)	0,774
8.	Questionnaire on social support for a healthy lifestyle (Pandurova & Karabeliova, 2022)	0,831
9.	Questionnaire on support for a healthy lifestyle from the environment (Pandurova & Karabeliova, 2022)	0,825
10.	Scale for measuring overall life satisfaction (Pavot & Diener, 1993; Ivanova, 2011)	0,865

The Bartlett's Test of Sphericity for all scales is $p < 0.001$, which provides evidence that the scales have good validity, and factor analysis can be applied.

To establish the factor structure and internal consistency of the questionnaires and scales used in this study, an exploratory factor analysis using the principal component method with orthogonal rotation (Varimax) and Kaiser normalization was applied. The results are presented in Table 4. From the obtained data, it can be seen that the included scales demonstrate good levels of internal consistency. The values of α range from 0.964 to 0.590.

Table 4: *Coefficients of internal consistency of the scales*

Scales	Number of items	Cronbach's Alpha (α)
Questionnaire on eating behavior and physical activity		
Unhealthy eating	8	0,800
Healthy eating	11	0,767
Physical activity	5	0,739
Questionnaire on beliefs about overweight		
Beliefs about the seriousness of the condition	7	0,712
Beliefs about the duration of the condition	4	0,683
Beliefs about the controllability of the condition	7	0,590
Beliefs about psychological factors	2	0,711
Dutch Eating Behavior Questionnaire		
Emotional eating	13	0,964
Taste and social stimulation	10	0,885
Restrained eating	10	0,871
General Self-Efficacy Scale	10	0,913
Scale of Positive and Negative Experiences		
Positive affect	6	0,910
Negative affect	6	0,865
Depression, Anxiety and Stress Scale		
Depressive symptoms	7	0,858
Anxiety	7	0,790
Stress	7	0,748
Short version of the Big Five		
Agreeableness	3	0,618
Openness to experience	3	0,781
Conscientiousness	3	0,689
Neuroticism	3	0,687
Extraversion	3	0,656
Questionnaire for the social support of a healthy lifestyle		
Family support	7	0,852
Friends support	5	0,749
Questionnaire for the support of a healthy lifestyle from the environment		
Physical environment	6	0,802
Organizational environment	5	0,750
Policies	7	0,639
Overall life satisfaction	5	0,871

These results provide the necessary confidence for further work and analysis of the results.

6. Verification of the research hypotheses and discussion of significant findings

6.1. Differences in eating behavior and physical activity based on demographic characteristics

The series of statistical results presented and analyzed in this section aim to test the assumptions made by *Hypothesis 1*. To examine the differentiating effect of sociodemographic characteristics on eating behavior and physical activity, Independent

Samples t-tests and one-way analysis of variance (ANOVA) were conducted. The differentiating effect of factors such as gender, age, education, place of residence, marital status, economic status, and health status on eating behavior and physical activity was analyzed.

Gender

The comparative analysis of the mean values on the scales for eating patterns demonstrates higher levels of emotional, external stimulation, and restrained eating in women. Regarding the scales measuring tendencies towards healthy and unhealthy eating, the results for both genders are quite similar. Physical activity is higher in male participants. The results are illustrated in **Figure 4.**

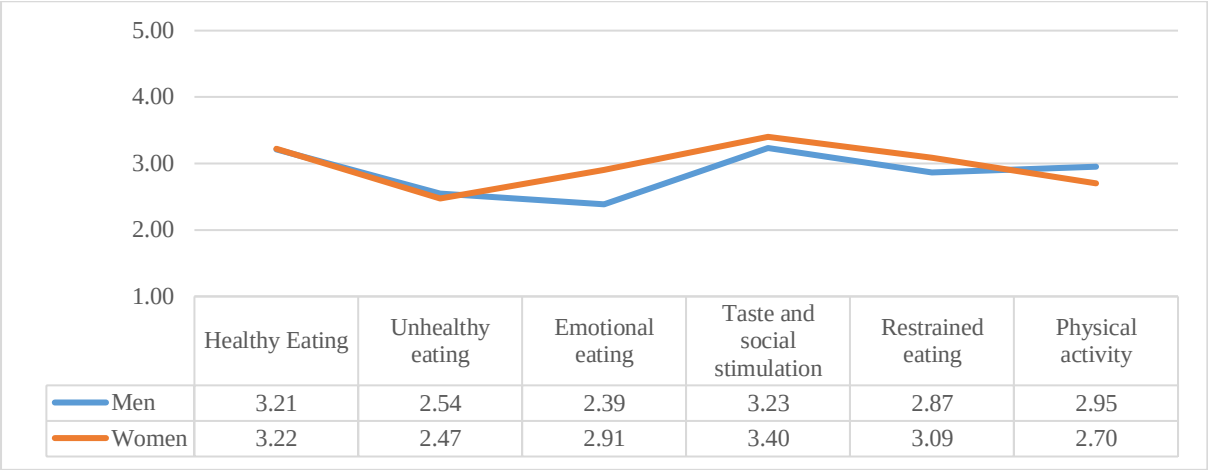

Figure 4: Differences in Eating Behaviour and physical activity according to gender

Statistically significant differences between women and men are observed on the scales for physical activity ($t_{(710)} = 2.553$; $p = 0.011$), emotional eating ($t_{(710)} = 4.194$; $p = 0.000$), and restrained eating ($t_{(710)} = 2.535$; $p = 0.011$).

Age

It is found that **age** significantly differentiates unhealthy eating ($F_{(3,708)} = 13.484$; $p = 0.000$), physical activity ($F_{(3,708)} = 16.954$; $p = 0.000$), and emotional eating ($F_{(3,708)} = 4.264$; $p = 0.005$). For variables with significant differences, a *post hoc Tukey HDS test* was applied to compare the groups pairwise. The data are presented in *Table 4.*

Table 4: Differentiating effect of age on eating behavior and physical activity.

Dependent Variable	ANOVA					
	Age	N	X	SD	F(3,708)	P
Unhealthy Eating	16 - 21 years	102	2.81	0.89	13,284	0,000
	22 - 35 years	155	2.64	0.80		
	36 - 50 years	269	2.42	0.78		
	51-76 years	186	2.27	0.73		
Physical Activity	16 - 21 years	102	3.15	0.93	16,954	0,000
	22 - 35 years	155	2.96	0.90		
	36 - 50 years	269	2.66	0.93		
	51-76 years	186	2.46	0.86		
Emotional Eating	16 - 21 years	102	2.45	1.08	4,264	0,005
	22 - 35 years	155	2.84	1.26		
	36 - 50 years	269	2.85	1.23		
	51-76 years	186	2.98	1.22		

Regarding **Unhealthy Eating**, the analysis showed that the mean values for the age group of 16 to 21 years are significantly different from the mean values for the groups encompassing individuals aged 36 to 50 years and 51 to 76 years. There is a significant difference between the second group, consisting of participants aged 22 to 35 years, compared to those in the age groups of 36 to 50 years and 51 to 76 years. No statistically significant differences were found between the first and second group, as well as between the third and fourth group.

The first two age groups, comprising respondents aged 16 to 35 years, tend to exhibit a tendency towards unhealthy eating compared to those in the age range of 36 to 76 years. It is evident that the greatest difference is observed between the youngest and oldest participants, with a decrease in the tendency for unhealthy eating as age advances.

Age significantly differentiates **physical activity** as well. Post-hoc tests show that the mean values for the age group of 16 to 21 years are significantly different from those of individuals aged 36 to 50 years and 51 to 76 years, forming the third and fourth groups. There is a statistical difference between the second group with participants aged 22 to 35 years compared to those in the age range of 36 to 50 years and 51 to 76 years. Again, no statistically significant differences were found between the first and second group, as well as between the third and fourth group. These results are not surprising and reveal the tendency of young people to be physically active, while physical activity decreases with advancing age.

Regarding **emotional eating**, a statistically significant difference was observed between the youngest age group (16 to 21 years old), respondents aged 36 to 50, and the age group of 51 to 76. The trends here are reversed, with emotional eating associated with increasing age.

Education

The results for the differentiating influence of education on eating behaviour and physical activity are presented in *Table 5*.

Table 5: Differentiating influence of education on eating behavior and physical activity

Dependent variable	Independent samples t-test					
	Education	N	X	SD	t (710)	P
Healthy eating	Secondary	232	3.12	0.70	**- 2,567**	**0,010**
	Higher	**480**	**3.26**	**0.70**		
Unhealthy eating	**Secondary**	**232**	**2.60**	**0.86**	**2,705**	**0,007**
	Higher	480	2.43	0.77		
Physical activity	**Secondary**	**232**	**2.87**	**0.97**	**2,565**	**0,011**
	Higher	480	2.68	0.91		
Emotional eating	Secondary	232	2.57	1.20	**- 3,921**	**0,000**
	Higher	**480**	**2.95**	**1.21**		
Taste and social stimulation	Secondary	232	3.24	0.88	**- 2,827**	**0,005**
	Higher	**480**	**3.44**	**0.87**		
Restrained eating	Secondary	232	3.08	0.87	0,565	0,572
	Higher	480	3.04	0.86		

Statistically significant differences in the mean values of the respondents' answers were found on the scales measuring **healthy eating** ($t_{(710)} = 2.567$; $p = 0.010$), **unhealthy eating** ($t_{(710)} = 2.705$; $p = 0.007$), **physical activity** ($t_{(710)} = 2.565$; $p = 0.011$), **emotional eating** ($t_{(710)} = 3.921$; $p = 0.000$), and **eating stimulated by taste and social situation** ($t_{(710)} = 2.827$; $p = 0.005$). The only exception is 'Restrained eating,' where no significant differences were found. Respondents with Secondary education tended to have unhealthier eating habits compared to participants with higher education, but they were more physically active. Higher

mean values on the scales measuring healthy eating, emotional eating, and external eating were observed among participants with higher education.

Place of Residence

In this study, the factor of **place of residence** significantly differentiates healthy eating ($F_{(2,709)} = 5.546$; $p = 0.004$) and **emotional eating** ($F_{(2,709)} = 3.012$; $p = 0.050$) (*Table 6*).

Table 6: Differentiating influence of place of residence on eating behaviour and physical activity

Dependent variable	ANOVA					
	Place of Residence	N	X	SD	$F_{(2,709)}$	P
Healthy eating	**Capital city**	**286**	**3.25**	**0.73**	**5,546**	**0,004**
	Large city	**228**	**3.30**	**0.67**		
	Small town and village	**198**	**3.08**	**0.70**		
Emotional eating	**Capital city**	**286**	**2.69**	**1.19**	**3,012**	**0,050**
	Large city	228	2.87	1.26		
	Small town and village	**198**	**2.96**	**1.22**		

Regarding **healthy eating**, post-hoc analysis shows that there are significant differences in the mean values of the groups with the studied individuals living in small towns and villages compared to respondents living in the capital and big cities. The current sample reports a trend - people in larger urban areas tend to have healthier eating habits.

The analysis registers a significant statistical difference in the mean values of the four groups on the **'Emotional Eating'** scale. Significant differences are observed between respondents living in the capital and participants from small towns and villages. Higher levels of emotional eating are reported among people from smaller populated areas.

Marital Status

Marital status is a differentiating factor only for healthy eating ($t_{(710)}=3.0131$; $p=0.00$). The results indicate a tendency for married participants in the current sample to have healthier eating habits ($X=3.28$) compared to unmarried respondents ($X=3.12$).

Economic Status

The differentiating influence of monthly income on eating behaviour and physical activity has been examined. The analysis of variance revealed statistically significant differences in the mean values of the groups on the scales of **'Unhealthy Eating'** ($F_{(3,708)}=2.425$; $p=0.045$) and **'Restrained Eating'** ($F_{(3,708)}=4.910$; $p=0.002$). **Figure 5** illustrates the trends in these dimensions.

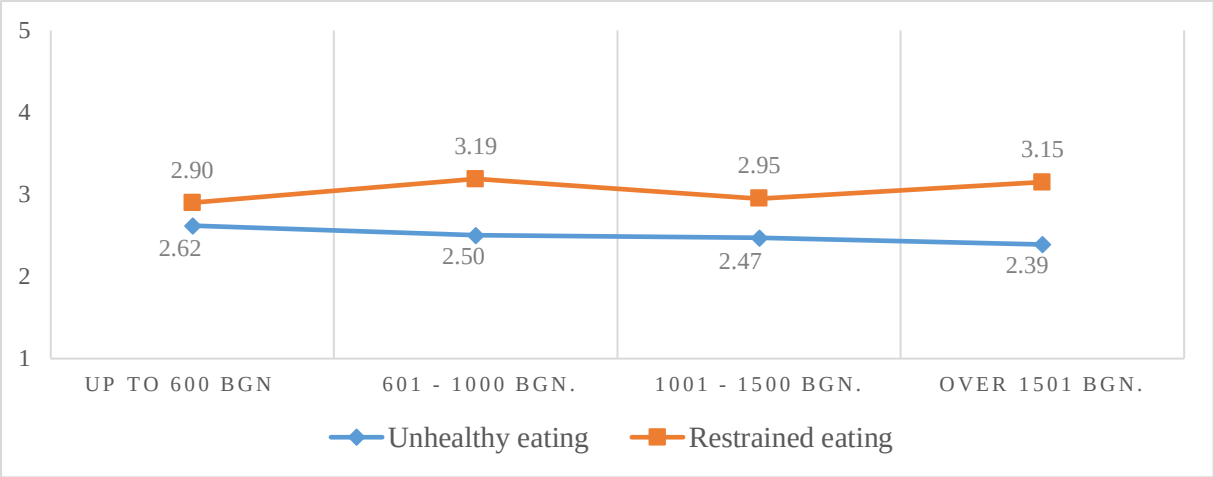

Figure 5: Differences in unhealthy eating and restrained eating according to monthly income

Regarding **unhealthy eating**, post hoc analysis registered a statistically significant difference between the mean value for the group with a monthly income up to 600 BGN and the averaged values for the group with an income above 1501 BGN. The results reveal a tendency for individuals with lower incomes to have more unhealthy eating habits.

Monthly income also differentiates the scale of '**Restrained Eating.**' The analysis showed that the mean values for the group with incomes up to 600 BGN were statistically significantly different from the mean values for the groups comprising individuals with incomes ranging from 601 to 1000 BGN and above 1500 BGN. A statistical difference was also found between the second group of individuals receiving incomes from 601 to 1000 BGN compared to respondents with monthly incomes from 1001 to 1500 BGN. The results indicate a tendency for individuals with the lowest monthly incomes to exhibit the weakest cognitive control over eating.

Health Status

Regarding health status, chronic illness is a differentiating factor only for physical activity ($t_{(710)}$=4.028; p=0.000). There is a tendency for individuals without chronic illness to be more physically active (X=2.85) compared to participants reporting chronic health problems (X=2.53).

6.2. Differences in Eating Behaviour and Physical Activity according to BMI

The analyses in this part of the study were conducted to test the assumptions made in *Hypothesis 2.*

The obtained results for the identified groups based on BMI: underweight, normal weight, overweight, and obesity on the scales measuring eating behavior (diet and patterns) and physical activity are presented in Figure 6 and Figure 7. Several trends can be observed from the graphical representation.

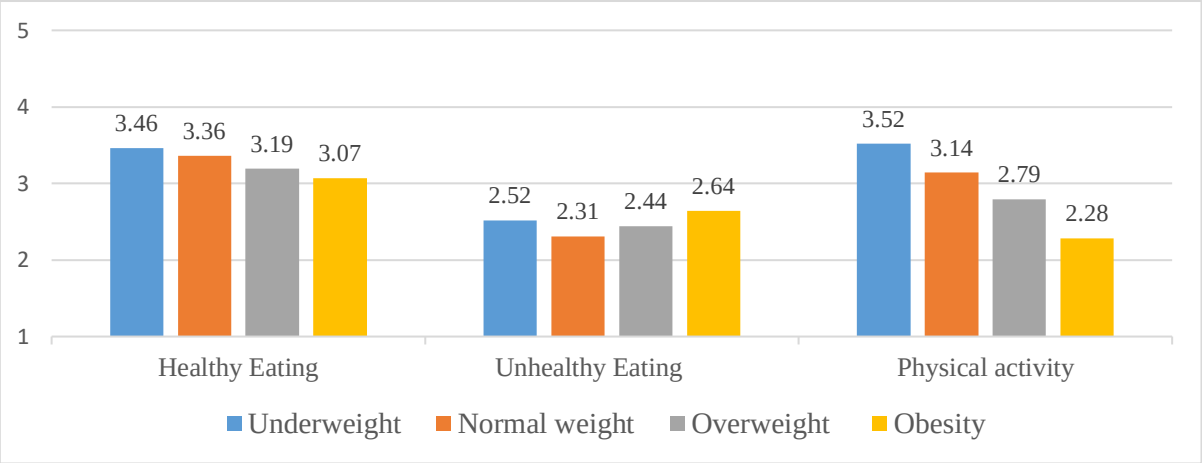

Figure 6: Differences in Eating Behaviour (Diet) and Physical Activity according to BMI

The visualization of the data illustrates that as the levels of healthy eating and physical activity decrease, the weight increases. The mean values on the 'Unhealthy Eating' scale are the highest among respondents with obesity and underweight, and the lowest for the group of individuals with normal weight.

Regarding emotional eating, an increase in the mean values on the scale is observed as the weight increases **(Figure 7)**. Accordingly, in the current sample, the levels of emotional eating are the lowest for the underweight group and the highest for participants with obesity.

Based on the obtained values, eating stimulated by taste and social factors is most characteristic for individuals with obesity and overweight, while the the lowest levels on this scale are registered among respondents with normal weight.

The lowest control over food intake, as indicated by the analysis of the mean values on the 'Restricted Eating' scale, is observed in the group consisting of people with obesity, followed by respondents with underweight. Cognitive restriction of eating shows the highest levels among individuals with overweight.

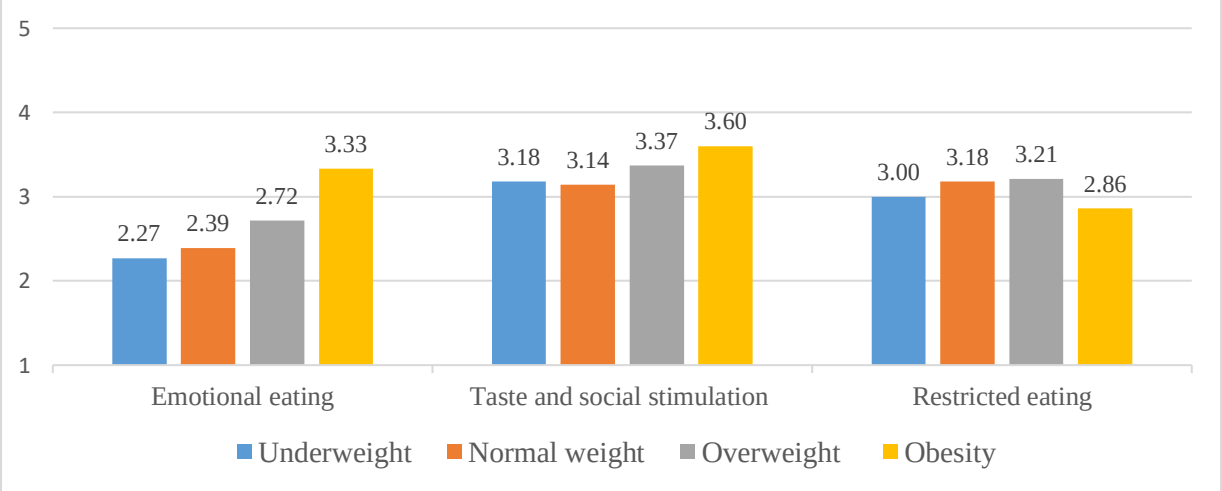

Figure 7: Differences in Eating Patterns according to BMI

In order to test for statistically significant differences, a one-way analysis of variance (ANOVA) was conducted. The procedure revealed a significant difference for all investigated variables, indicating that BMI significantly differentiates eating behavior and physical activity. These results confirm the assumptions made in *Hypothesis 2*.

A *post hoc test*, Tukey's Honestly Significant Difference (HSD), was applied to compare the groups pairwise. The results are presented in Table 7.

Regarding healthy eating ($F_{(3,708)}$=8.489; p=0.000), the mean value for the group of individuals with obesity is significantly different from the mean values of the groups of respondents with underweight and normal weight. No statistical significance of the result was found between the other groups. There is a tendency that individuals with underweight and normal weight have healthier eating habits compared to participants with obesity.

For **unhealthy eating habits** ($F_{(3,708)}$=7.490; p=0.000), the **post hoc test** reveals a significant statistical difference between the mean values of the groups of individuals with obesity compared to those with normal weight and overweight. No significant difference was found between the underweight and overweight groups. The group of individuals with overweight is not statistically significantly different from the groups with normal weight or underweight. The results indicate that respondents with underweight and obesity have more unhealthy diets compared to the individuals with normal weight and overweight.

Table 7: Differentiating effect of BMI on eating behavior and physical activity

Dependent variable	ANOVA					
	Weight by BMI	N	X	SD	$F_{(3,708)}$	P
Healthy eating	**Underweight**	**35**	**3.46**	**0.74**	8.489	0.000
	Normal weight	**225**	**3.36**	**0.70**		
	Overweight	178	3.20	0.65		
	Obesity	**274**	**3.08**	**0.71**		
Unhealthy eating	**Underweight**	**35**	**2.52**	**0.82**	7.490	0.000
	Normal weight	**225**	**2.32**	**0.80**		
	Overweight	**178**	**2.44**	**0.74**		
	Obesity	**274**	**2.65**	**0.82**		
Emotional eating	**Underweight**	**35**	**2.27**	**1.06**	31.459	0.000
	Normal weight	**225**	**2.39**	**1.11**		
	Overweight	**178**	**2.72**	**1.16**		
	Obesity	**274**	**3.33**	**1.19**		
Taste and social stimulation	**Underweight**	**35**	**3.18**	**0.94**	12.608	0.000
	Normal weight	**225**	**3.14**	**0.90**		
	Overweight	**178**	**3.37**	**0.80**		
	Obesity	**274**	**3.60**	**0.85**		
Restricted eating	Underweight	35	3.00	1.20	8.665	0.000
	Normal weight	**225**	**3.18**	0.92		
	Overweight	**178**	**3.21**	0.82		
	Obesity	**274**	**2.86**	0.75		
Physical activity	**Underweight**	**35**	**3.53**	**0.72**	54.336	0.000
	Normal weight	**225**	**3.14**	**0.85**		
	Overweight	**178**	**2.79**	**0.88**		
	Obesity	**274**	**2.28**	**0.83**		

BMI significantly differentiates the individuals regarding **emotional eating** ($F_{(3,708)}$=31.459; p=0.000). A significant difference is found between the mean values of respondents with obesity, where the highest levels are observed, compared to all other groups: normal weight, underweight, and overweight. The mean value on the emotional eating scale for individuals with overweight is higher and statistically different from those of individuals with normal weight and underweight.

Regarding **externally stimulated eating** ($F_{(3,708)}$=12.608; p=0.000), the results are identical with those of emotional eating. A significant difference is observed between the group of individuals with obesity and the other three groups: underweight, normal weight and

overweight. The group with overweight is not statistically significantly different from the underweight group but differs from individuals with normal weight. The results indicate a tendency for individuals with obesity and overweight to be more susceptible to sensory and hedonistic signals associated with food.

In the context of **restrained eating** ($F_{(3,708)}$=8.665; p=0.000), the analysis reveals a statistically significant difference between the groups with normal weight and overweight, compared to the obese group. No significant difference was observed between the latter and participants with underweight. Respondents with obesity and underweight showed lower levels on this scale, indicating lower cognitive control over food intake.

BMI significantly differentiates participants in the various groups regarding **physical activity** ($F_{(3,708)}$=54.336; p=0.000). A statistically significant difference was found between all groups except for those with underweight and normal weight. The group of respondents with obesity is significantly different from the normal weight, underweight, and overweight groups. Consequently, the difference in mean values for individuals with overweight is statistically significant compared to the groups of participants with obesity, normal weight, and underweight. These results suggest that individuals with overweight and obesity have lower levels of physical activity.

6.3. Differences in psychological, social and environmental (obesogenic) correlates depending on BMI

The presented information from the conducted one-way analysis of variance is related to the differentiating effect of BMI on the variables included in the model (*Hypothesis 3*).

Psychological correlates

Beliefs about overweight:

The first introduced variable related to psychological correlates is beliefs about overweight. BMI significantly differentiates three of the studied dimensions.

For **'Beliefs about the duration of the condition'** ($F_{(3,708)}$ = 8.987, p = 0.000), there is a trend indicating that as BMI increases, the mean values of beliefs about the duration of the condition also increase. The post hoc test reveals significant differences in the mean values between individuals with obesity (X = 4.32) and all other groups: underweight (X = 3.98), normal weight (X = 4.03), and overweight (X = 4.10). There are no significant differences among the latter three groups. The highest mean values on this scale are reported by respondents with obesity, indicating stronger beliefs that problems related to overweight are constant.

The mean values of participants in the distinct groups, according to BMI, on the scale '**Beliefs about the controllability of the condition'** ($F_{(3,708)}$ = 12.507, p = 0.000) are as follows: underweight (X = 1.67), normal weight (X = 1.77), overweight (X = 1.90), and obesity (X = 2.03). The arithmetic mean values show an increase with each subsequent group, with the highest values found among respondents with obesity. These data reflect a tendency that as weight increases, the belief that weight management is associated with behavioral control decreases. A statistically significant difference is observed in the mean values of the obesity group compared to the underweight and normal weight groups, as well as between the overweight and underweight groups.

Regarding '**Beliefs about the psychological factors of the condition'** ($F_{(3,708)}$ = 8.564, p = 0.000), the other measured dimension in the questionnaire, a significant difference is also observed. It is found between the group of individuals with obesity (X = 4.58) and all other groups - underweight (X = 4.10), normal weight (X = 4.31), and overweight (X = 4.38). Based on the mean values, a trend can be identified that with an increase in BMI, respondents perceive a greater influence of the psychological component. Comparative analysis does not

confirm statistically significant differences between the levels of beliefs about psychological factors among the underweight, normal weight, and overweight groups.

Life satisfaction

In the current study, the cognitive component of subjective well-being related to participants' perception of overall life satisfaction was measured ($F_{(3,708)} = 12.428$, $p = 0.000$). The mean values indicate a tendency where life satisfaction is higher among individuals with normal weight (X = 3.57), overweight (X = 3.51) and underweight (X = 3.49). There are no statistically significant differences among these three groups. The post hoc test shows significant differences in the mean values among individuals with obesity (X = 3.10), where the reported life satisfaction is the lowest.

Affective states

A different dimension of exploring the psychological correlates reflects the affective component. BMI significantly differentiates positive affect (F(3,708)=5.846; p=0.001) and negative affect (F(3,708)=4.447; p=0.004), as well as reported levels of depression (F(3,708)=6.730; p=0.000), anxiety (F(3,708)=17.828; p=0.000), and stress (F(3,708)=8.023; p=0.000) in the participants under study.

From Figure 8 it can be observed that concerning the affective states, there is almost no difference in the mean values among respondents with normal weight and overweight/obese individuals.

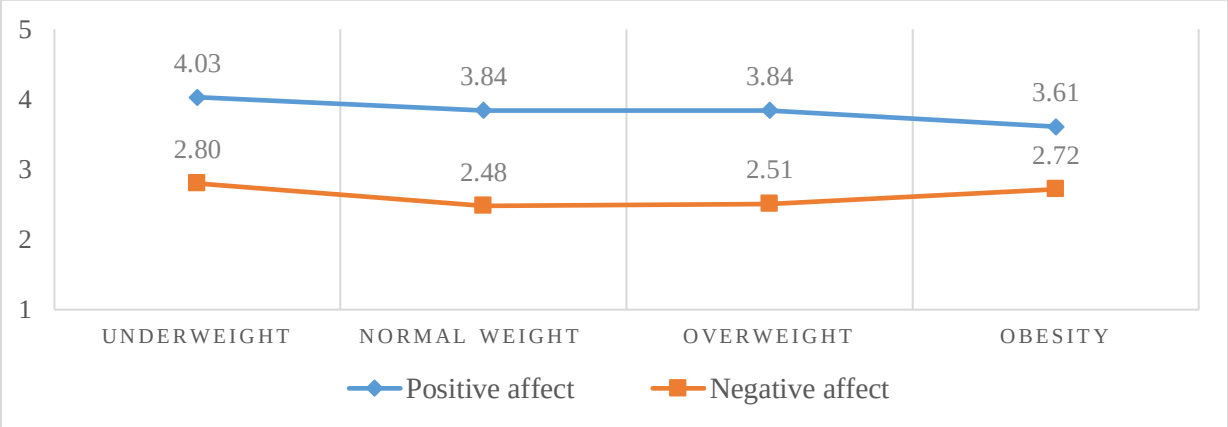

Figure 8: Differences in levels of positive and negative affect according to BMI

For the **'Positive Affect'** scale, the post-hoc test reveals significant differences between the group of respondents with obesity and the other groups, with the former reporting the lowest levels of positive experiences. Regarding **negative affect**, the differences in mean values are statistically significant between the groups of individuals with normal weight and obesity.

The differences in mean values among the groups, as measured by the 'Depressive Symptoms, Anxiety and Stress' scale, are presented in **Figure 9.**

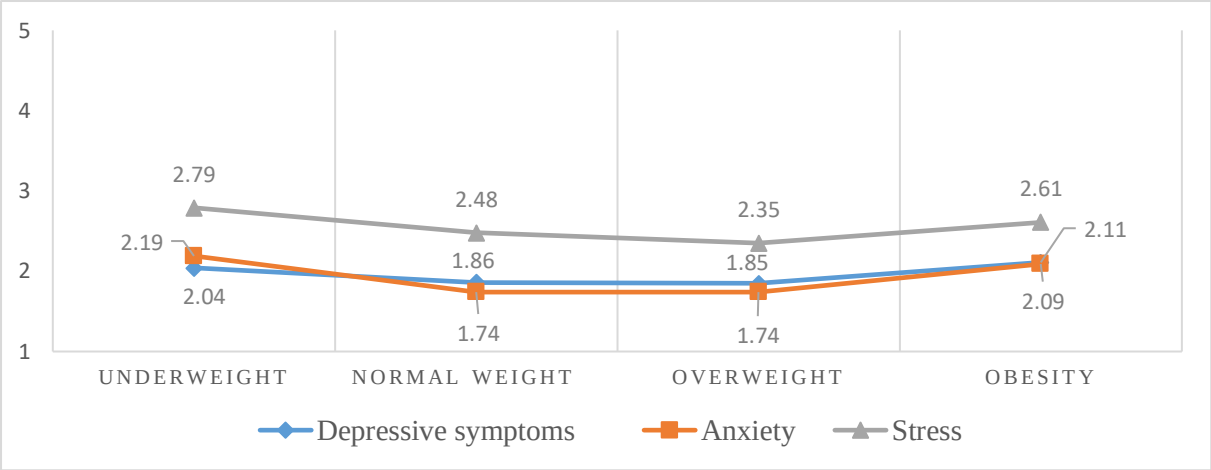

Figure 9: Differences in levels of depressive symptoms, anxiety and stress according to BMI

Depressive symptoms are the highest in the group of individuals observed with obesity and significantly different from the mean values of the groups of individuals with normal weight and overweight.

The average values on the **'Anxiety'** scale are the highest in individuals with underweight and obesity, with no statistically significant difference between these two groups. Compared to the other two groups (normal weight and overweight), their average values are significantly higher.

BMI differentiates participants in terms of **stress,** with significant differences observed between the mean values of the groups with underweight compared to respondents with normal weight and overweight, as well as between respondents with obesity and normal weight and overweight. The post hoc test does not show a statistically significant difference in stress levels among individuals with underweight and obesity, where higher values on the scale are recorded.

Body dissatisfaction

Another affective element related to weight is body dissatisfaction. The average values of measured dissatisfaction with body image are presented in **Figure 10**.

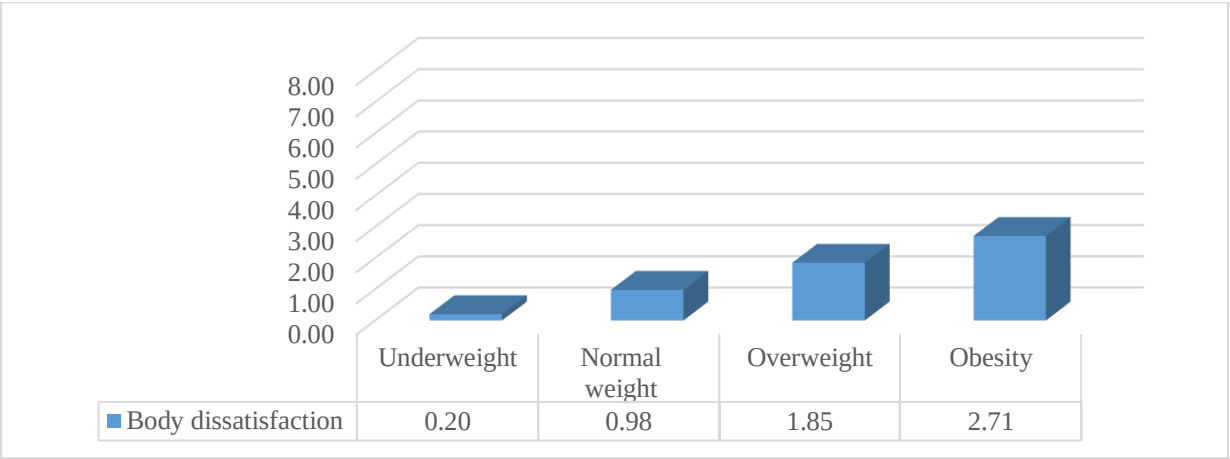

Figure 10: Differential impact of BMI on body dissatisfaction

The obtained results reveal significant differences ($F_{(3,708)} = 163.496$, $p = 0.000$) among the four groups, with an increase in weight correlating to higher levels of body dissatisfaction.

Social correlates

Social support for a healthy lifestyle

The differentiating role of BMI in terms of social support from family and friends for a healthy lifestyle has been examined. **Figure 11** presents the mean values of the four groups, consisting of individuals classified as underweight, normal weight, overweight and obese.

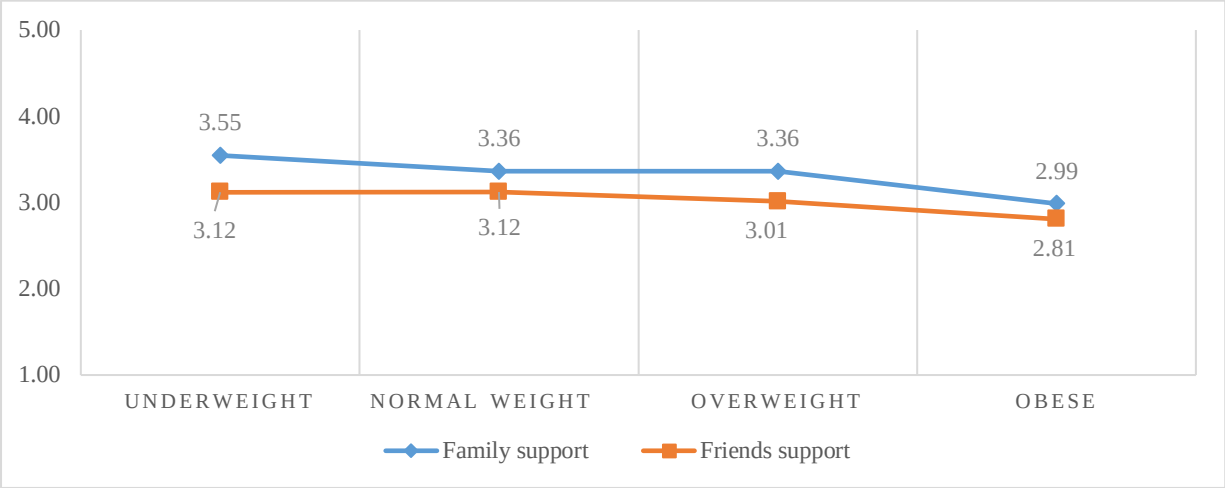

Figure 11: Differences in social support for a healthy lifestyle based on BMI

It is evident that all participants, regardless of their weight, rate family support for a healthy lifestyle higher. A statistically significant difference in mean values in this dimension ($F_{(3,708)} = 10.928$, $p = 0.000$) was observed between respondents classified as obese and the other groups: underweight, normal weight and overweight. These results indicate that individuals classified as obese perceive the lowest level of family support.

Regarding the differentiating role of BMI in social support for a healthy lifestyle from friends ($F_{(3,708)} = 6.127$, $p = 0.000$), the post-hoc test reveals a statistically significant difference in mean values between the group of respondents classified as obese and the group with normal weight. The lower results among the former indicate less perceived support.

Environmental (obesogenic) correlates

The differentiating effect of BMI on variables related to the outermost spheres of influence, according to the Ecological Model, has been investigated. Statistically significant differences were found in all three scales of the questionnaire: 'Support for a healthy lifestyle from organizational factors' ($F_{(3,708)} = 4.010$, $p = 0.008$), 'Support for a healthy lifestyle from the physical environment' ($F_{(3,708)} = 9.559$, $p = 0.000$), and 'Policies supporting a healthy lifestyle' ($F_{(3,708)} = 4.491$, $p = 0.004$), depending on weight. **Figure 12** illustrates the mean values of the formed groups according to BMI on the three scales included in the study to measure contextual factor support.

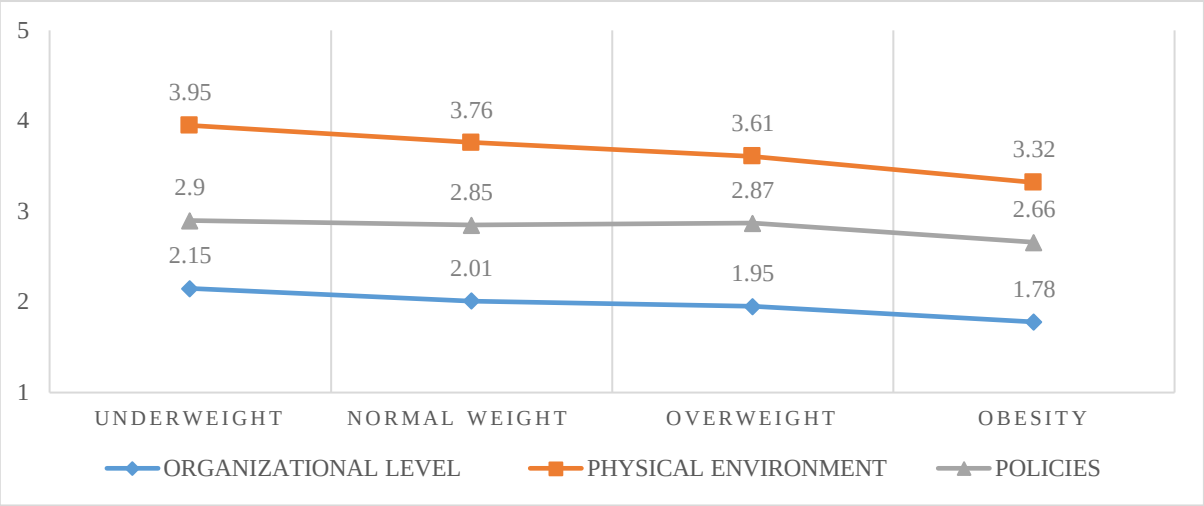

Figure 12: Differences in support for a healthy lifestyle from the environment based on BMI

Support for a healthy lifestyle from the organizational environment

Regarding organizational factors, a significant difference was found between the group of individuals classified as obese and respondents with normal weight. This result indicates a trend where individuals with weight within healthy limits value their work/school environment as more supportive.

Support for a healthy lifestyle from the physical environment

As shown in **Figure 12**, all participants rate factors supporting a healthy lifestyle from the physical organization of the environment the highest. Higher values are observed among individuals classified as underweight, with a trend of perceived support from the immediate physical environment decreasing with increasing BMI. The post-hoc test reveals a statistically significant difference in mean values between the group of individuals classified as obese and the groups consisting of underweight, normal weight, and overweight individuals. No significant difference in mean values is observed among the latter three groups.

Policies supporting a healthy lifestyle

BMI differentiates the results on this scale, with statistically significant differences between the mean values of the group classified as obese compared to the groups with normal weight and overweight. This reflects individuals with obesity perceiving the policies as less stimulating for healthy behaviour.

For the purposes of this study, an analysis was conducted and presented to reflect the variations in exercise frequency based on the presence of a supportive environment. The mean values of the groups are presented in **Figure 13**.

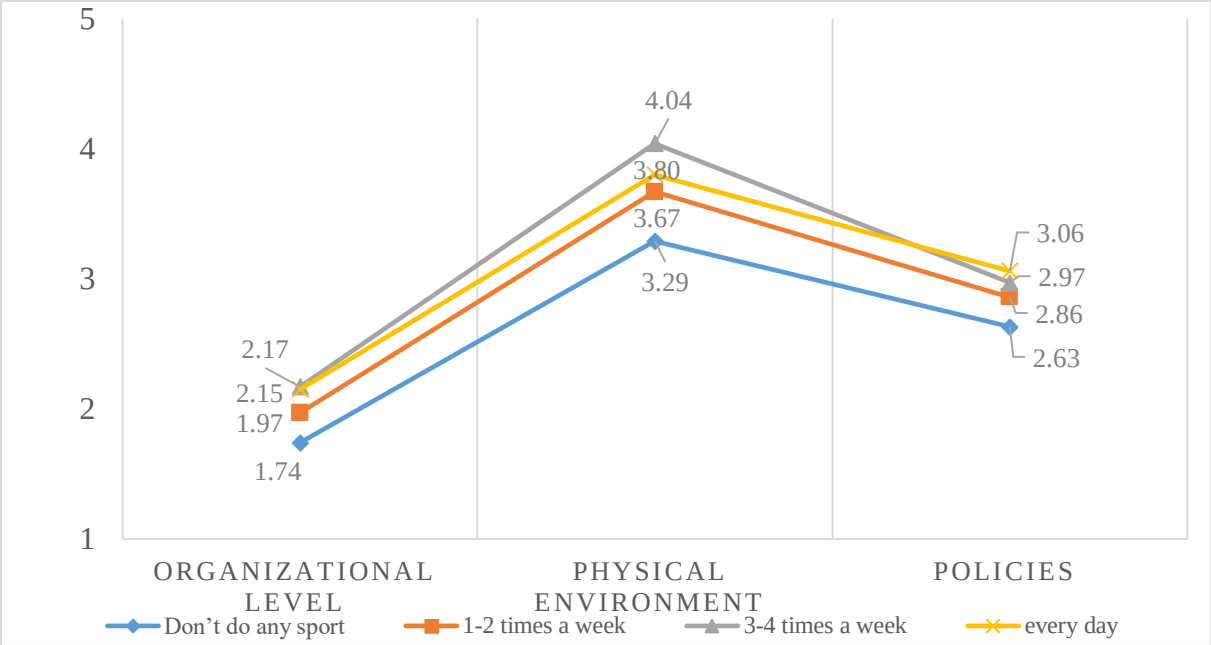

Figure 13: Differences in Exercise Frequency According to Environmental Factors

At the **organizational level** (F(3,708) = 9.183; p = 0.000), an increase in exercise frequency is observed when respondents perceive the environment as more supportive. Significant differences were found between the mean values of the non-exercising individuals and all other groups.

Regarding the **physical environment** (F(3,708) = 19.310; p = 0.000), post hoc analysis again revealed statistically significant differences in the mean values between the group of non-exercising respondents and the other groups

At the **policy** level (F(3,708) = 11.691; p ≤ 0.000), statistically significant differences were registered between the mean values of the non-exercising respondents and the participants in the other groups.

6.4. Correlation between the Studied Phenomena

In accordance with the objectives and *Hypothesis 4* of the study, a series of correlation analyses were conducted to examine the relationships between the studied constructs.

Correlation between Diet (Nutrition and Patterns) and Physical Activity

The present study explores the relationship between dietary behaviour, such as daily diet, physical activity and dietary patterns. The results of the analysis are presented in *Table 8.*

Table 8: Correlations between Daily Diet, Physical Activity, and Dietary Patterns

	Healthy Eating	Unhealthy Eating	Physical Activity	Emotional Eating	Taste and Social Stimulation	Restrained eating
Healthy Eating	-	**-0,224****	**0,291****	-0,094*	-0,090*	**0,148****
Unhealthy Eating	**-0,224****	-	**-0,197****	**0,245****	**0,411****	**-0,412****
Physical Activity	**0,291****	**-0,197****	-	**-0,255****	**-0,267****	**0,284****
Emotional Eating	-0,094*	**0,245****	**-0,255****	-	**0,586****	-0,051
Taste and Social Stimulation	-0,090*	**0,411****	**-0,267****	**0,586****	-	**-0,147****
Restrained eating	**0,148****	**-0,412****	**0,284****	-0,051	**-0,147****	-

** p ≤ 0,01; * p ≤ 0,05

Healthy eating is positively correlated with physical activity and the pattern of dietary restraint and negatively associated with unhealthy eating. This reflects the tendency for higher scores on the 'Healthy Eating' scale to be associated with higher levels of physical activity and greater cognitive control over eating.

As mentioned, **unhealthy eating** is negatively correlated with healthy eating, as well as with physical activity and dietary restraint. This result indicates a trend where increasing unhealthy eating is associated with decreased physical activity, consumption of healthy food items and the ability to exert control over eating. On the other hand, unhealthy eating is positively correlated with emotional eating and externally stimulated eating. These results suggest that as unhealthy eating increases, so does emotional and externally stimulated food consumption.

Significant positive correlations were found between emotional eating, unhealthy eating and taste- and socially stimulated eating.The result interpreted means that increased emotional eating is associated with increased unhealthy eating and eating stimulated by external cues. A significant correlation was also found between emotional eating and physical activity, with a negative direction, indicating that increased emotional eating is associated with decreased engagement in physical activity.

In addition to being positively associated with unhealthy and emotional eating, **taste and socially stimulated eating** is negatively correlated with physical activity and dietary restraint. This means that as scores on the scale measuring this eating pattern increase, physical activity and cognitive control over eating behaviour decrease.

Restrained eating, on the other hand, is positively associated with healthy eating and physical activity. A negative correlation was found between this type of eating and unhealthy and externally stimulated eating.

Overall, **physical activity** interacts positively with healthy and cognitively restrained eating and negatively with unhealthy, emotional and externally stimulated eating.

Healthy Eating

Significant correlations are observed between healthy eating and the investigated constructs at different levels of the Ecological Model (*Table 9*).

Table 9: Correlation between Healthy Eating, Psychological, Social and Environmental (Obesogenic) Factors

	Healthy Eating
Psychological Correlates	
Beliefs about the seriousness of the condition	0,030
Beliefs about the chronicity of the condition	-0,015
Beliefs about the controllability of the condition	-0,052
Beliefs about the psychological factors of the condition	0,005
Self-efficacy	**0,132****
Life satisfaction	**0,222****
Positive affect	**0,190****
Negative affect	**-0,109****
Depressive symptoms	**-0,126****
Anxiety	**-0,168****
Stress	**-0,113****
Body dissatisfaction	**-0,275****
Agreeableness	0,068
Openness to new experiences	0,047
Conscientiousness	**0,126****
Neuroticism	**-0,106****
Extraversion	0,085*
Social Correlates	
Family support for a healthy lifestyle	**0,301****
Friends support for a healthy lifestyle	**0,194****
Environmental (Obesogenic) Correlates	
Organizational environment support for a healthy lifestyle	**0,118****
Physical environment support for a healthy lifestyle	**0,216****
Policies supporting a healthy lifestyle	**0,239****

$p \leq 0.01$; * $p \leq 0.05$

Unhealthy Eating

The significant correlations between unhealthy eating and psychological, social, and environmental correlates are evident from *Table 10*.

Table 10: Correlation between Unhealthy Eating, Psychological, Social, and Environmental (Obesogenic) Factors

	Unhealthy Eating
Psychological Correlates	
Beliefs about the seriousness of the condition	-0.061
Beliefs about the chronicity of the condition	0,079*
Beliefs about the controllability of the condition	**0,115 ****
Beliefs about the psychological factors of the condition	0,074*
Self-efficacy	**-0,138****
Life satisfaction	**-0,112****
Positive affect	-0,088*
Negative affect	**0,219****
Depressive symptoms	**0,179****
Anxiety	**0,236****
Stress	**0,237****
Body dissatisfaction	**0,176****
Agreeableness	-0,003
Openness to new experiences	-0,051
Conscientiousness	**-0,129****
Neuroticism	**0,195****
Extraversion	-0,053
Social Correlates	
Family support for a healthy lifestyle	**- 0,291****
Friends support for a healthy lifestyle	**-0,092***
Environmental (Obesogenic) Correlates	
Organizational environment support for a healthy lifestyle	0,037
Physical environment support for a healthy lifestyle	**-0,103****
Policies supporting a healthy lifestyle	-0,042

$p \leq 0.01$; * $p \leq 0.05$

Emotional Eating

The results of the correlation analysis reveal the most statistically significant relationships of emotional eating with other studied constructs (*Table 11*).

Table 11: Relationship between emotional eating and psychological, social, and environmental (obesogenic) factors

	Emotional Eating
Psychological Correlates	
Beliefs about the seriousness of the condition	**0,113****
Beliefs about the chronicity of the condition	**0,212****
Beliefs about the controllability of the condition	**0,166****
Beliefs about the psychological factors of the condition	**0,332****
Self-efficacy	**-0,219****
Life satisfaction	**-0,233****
Positive affect	**-0,218****
Negative affect	**0,306****
Depressive symptoms	**0,335****
Anxiety	**0,372****
Stress	**0,339****
Body dissatisfaction	**0,419****
Agreeableness	0,041
Openness to new experiences	-0,084*
Conscientiousness	**-0,149****
Neuroticism	**0,292****
Extraversion	-0,046
Social Correlates	
Family support for a healthy lifestyle	**-0,215****
Friends support for a healthy lifestyle	**-0,154****
Environmental (Obesogenic) Correlates	
Organizational environment support for a healthy lifestyle	**-0,134****
Physical environment support for a healthy lifestyle	**-0,147****
Policies supporting a healthy lifestyle	**-0,116****

$p \leq 0.01$; * $p \leq 0.05$

Taste and Social Stimulation

Significant relationships are found between this pattern of eating and the studied constructs, located at different levels of the ecological model (*Table 12*).

Table 12: Relationship between taste and social stimulation eating and psychological, social, and environmental (obesogenic) factors

	Taste and Social Stimulation
Psychological Correlates	
Beliefs about the seriousness of the condition	**0,099****
Beliefs about the chronicity of the condition	**0,177****
Beliefs about the controllability of the condition	**0,115****
Beliefs about the psychological factors of the condition	**0,236****
Self-efficacy	**-0,137****
Life satisfaction	**-0,111****
Positive affect	-0,085*
Negative affect	**0,216****
Depressive symptoms	**0,224****
Anxiety	**0,314****
Stress	**0,266****
Body dissatisfaction	**0,303****
Agreeableness	0,049
Openness to new experiences	-0,035
Conscientiousness	**-0,121****
Neuroticism	**0,201****
Extraversion	0,022
Social Correlates	
Family support for a healthy lifestyle	**-0,201****
Friends support for a healthy lifestyle	**-0,133****
Environmental (Obesogenic) Correlates	
Organizational environment support for a healthy lifestyle	-0,085*
Physical environment support for a healthy lifestyle	**-0,107****
Policies supporting a healthy lifestyle	-0,044

$p \leq 0.01$; * $p \leq 0.05$

Restrained Eating

The results of the analysis of the relationships between cognitive restrained eating and the included constructs in the study show a significant difference in the interaction configuration of this eating pattern (compared to emotional eating and taste and social stimulation eating) (*Table 13).*

Table 13: Correlation between, Restrained Eating, Psychological, Social, and Environmental (Obesogenic) Factors

	Restrained Eating
Psychological Correlates	
Beliefs about the seriousness of the condition	**0,177****
Beliefs about the chronicity of the condition	-0,001
Beliefs about the controllability of the condition	**-0,115****
Beliefs about the psychological factors of the condition	0,062
Self-efficacy	**0,132****
Life satisfaction	**0,116****
Positive affect	0,054
Negative affect	-0,043
Depressive symptoms	-0,057
Anxiety	-0,047
Stress	-0,031
Body dissatisfaction	-0,053*
Agreeableness	0,097**
Openness to new experiences	0,081*
Conscientiousness	**0,242****
Neuroticism	0,003
Extraversion	0,097**
Social Correlates	
Family support for a healthy lifestyle	**0,203****
Friends support for a healthy lifestyle	-0.018
Environmental (Obesogenic) Correlates	
Organizational environment support for a healthy lifestyle	0,041
Physical environment support for a healthy lifestyle	**0,126****
Policies supporting a healthy lifestyle	**0,122****

$p \leq 0.01$; * $p \leq 0.05$

Physical Activity

The results of the analysis of the interaction between physical activity and correlates at different levels, according to the Ecological Model, are presented in *Table 14*.

Table 14: Relationship between physical activity, psychological, social and environmental (obesogenic) factors

	Physical Activity
Psychological Correlates	
Beliefs about the seriousness of the condition	0,040
Beliefs about the chronicity of the condition	**-0,241****
Beliefs about the controllability of the condition	**-0,243****
Beliefs about the psychological factors of the condition	-0,085*
Self-efficacy	**0,239****
Life satisfaction	**0,270****
Positive affect	**0,258****
Negative affect	**-0,135****
Depressive symptoms	**-0,248****
Anxiety	**-0,224****
Stress	**-0,157****
Body dissatisfaction	**-0,466****
Agreeableness	0,073
Openness to new experiences	**0,115****
Conscientiousness	**0,208****
Neuroticism	**-0,174****
Extraversion	**0,130****
Social Correlates	
Family support for a healthy lifestyle	**0,297****
Friends support for a healthy lifestyle	**0,228****
Environmental (Obesogenic) Correlates	
Organizational environment support for a healthy lifestyle	**0,205****
Physical environment support for a healthy lifestyle	**0,299****
Policies supporting a healthy lifestyle	**0,235****

$p \leq 0.01$; * $p \leq 0.05$

The results of the correlation analyses indicate that there are numerous relationships between eating behaviour, physical activity and correlates at different levels according to the Ecological Model. Most correlation coefficients range from low to moderate. These findings suggest that multiple factors influence the studied phenomena and serve as a basis for further statistical procedures in the study. The Ecological Model posits various correlates that may have a potential effect on eating behaviour, physical activity, body weight and health.

To test the hypothesis regarding their predictive function, a stepwise regression analysis was conducted. The statistical procedure allows for the examination of the last sub-hypothesis raised in *Hypothesis 4*, as well as *Hypothesis 5*, by constructing a regression equation with dependent and independent variables. Two ways of influence were analyzed.

6.5. Effect of psychological, social, and environmental (obesogenic) correlates on dietary behavior and physical activity

Initially, a multiple stepwise regression analysis was conducted with eating behaviour (healthy, unhealthy, emotional, externally motivated and restricted eating) and physical activity as dependent variables. All operationalized factors theoretically capable of predicting eating behaviour and physical activity (left column of the model) were included as independent variables to test their effects on the dependent variable (**Figure 14**).

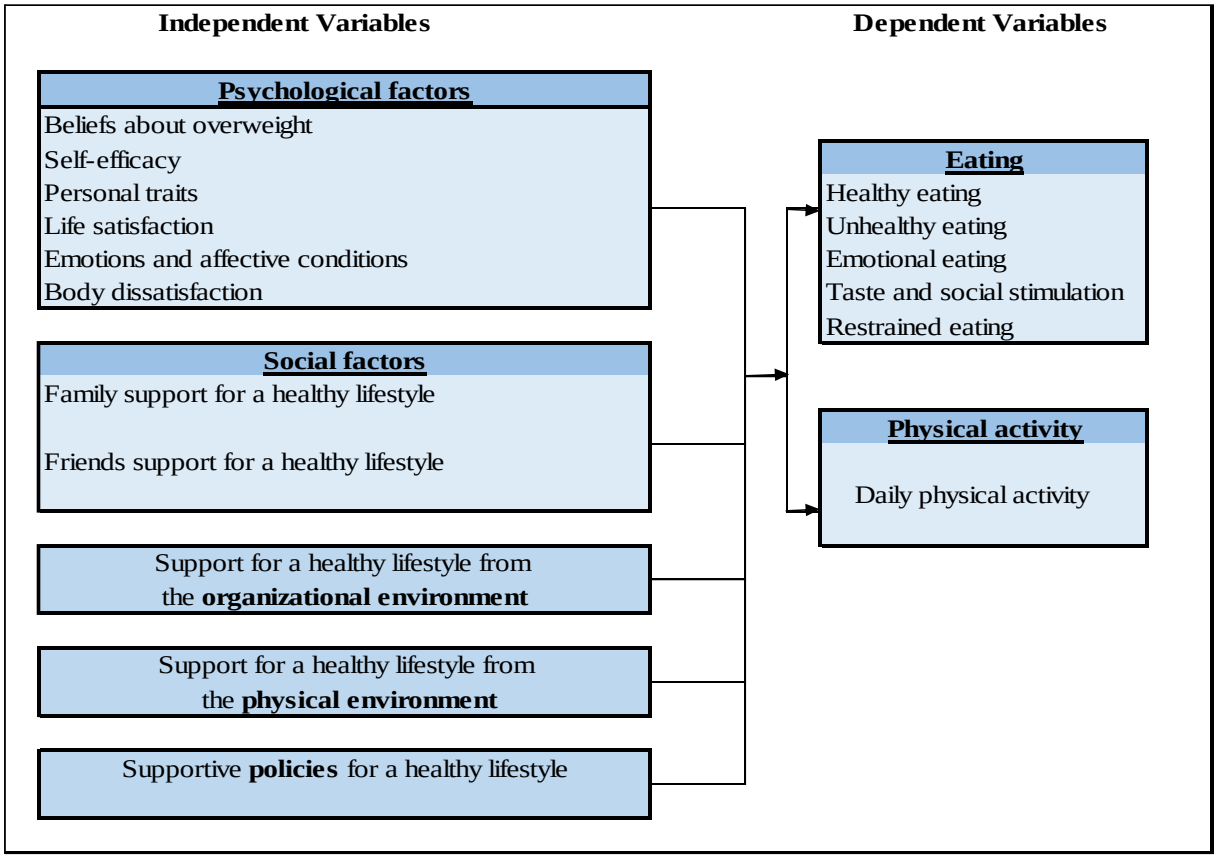

Figure 14: Dependent and Independent Variables - First Regression Model

Based on the previous analysis of the correlation between daily food choices of healthy and unhealthy diets, food patterns (emotional, externally stimulated and restricted eating) and physical activity, where significant relationships were found among these constructs, the decision was made to include them as independent variables and potential predictors of the studied behaviour in the regression model.

The obtained results identify potential predictors of eating behavior (diet and pattern) and physical activity. It is found that variables from different levels of the ecological model are included in the regression models.

Healthy Eating

The analysis reveals that the combination of variables: **family support for a healthy lifestyle** ($\beta = 0.190$, $p = 0.000$), **physical activity** ($\beta = 0.148$, $p = 0.000$), **policies** ($\beta = 0.154$, $p = 0.000$), **body dissatisfaction** ($\beta = -0.152$, $p = 0.000$), and **beliefs in the duration of the condition** ($\beta = 0.086$, $p = 0.016$) significantly predicts healthy eating ($F_{(5,706)} = 30.495$, $p = 0.000$). The value of the adjusted coefficient of determination is $\Delta R2 = 0.172$. This indicates

that 17.2% of the variance in healthy eating can be explained by the presented regression model (**Figure 15**).

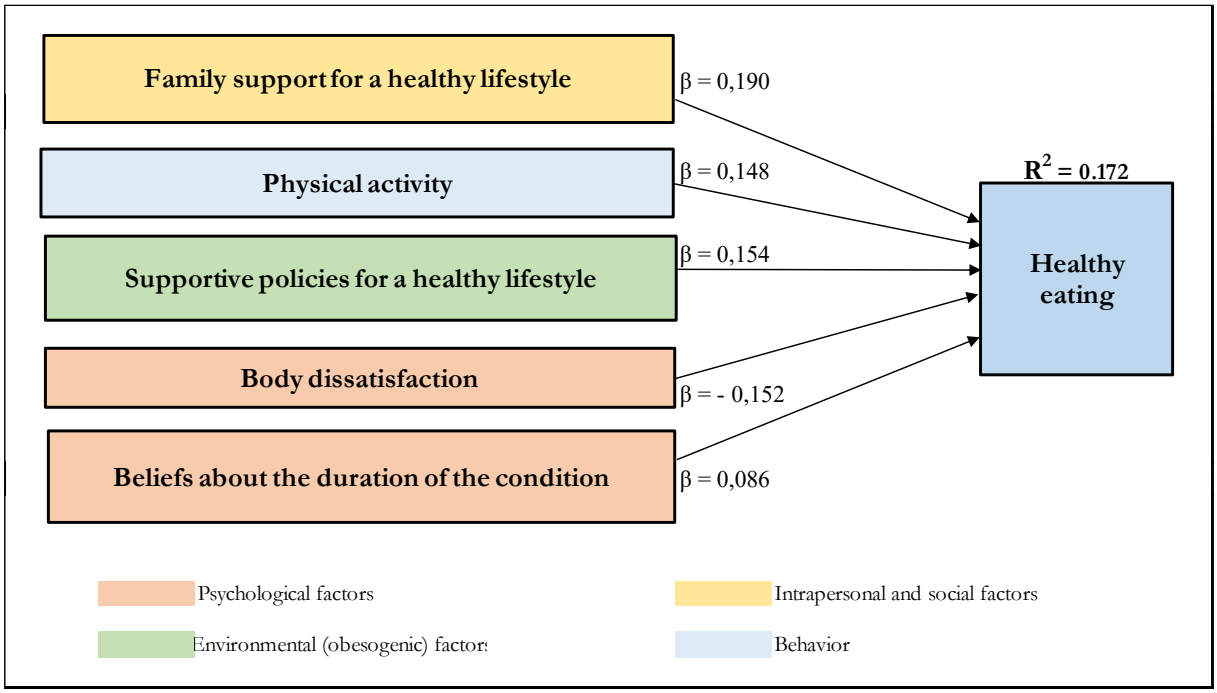

Figure 15: Significant Effect of Independent Variables on Healthy Eating

Family support for a healthy lifestyle has the highest predictive weight in the current regression model (β = 0.190, p = 0.000) and contributes to 8.9% of the explanation of healthy eating (Δ R2 = 0.089, $F_{(1,710)}$ = 70.744, p = 0.000). This result shows that modeling and promoting a healthy diet within the family increases the level of healthy eating among respondents (r = 0.301) and indicates the influence of the family in shaping and maintaining dietary habits towards health.

Physical activity is identified as the next significant potential predictor (β = 0.148, p = 0.000), contributing approximately 4.4% of the variations in higher levels of healthy eating. This means that greater engagement in physical activity increases the level of healthy eating (r = 0.291). With the addition of this variable, the adjusted coefficient of determination increases (Δ R2 = 0.133, $F_{(2,709)}$ = 55.392, p = 0.000), and the explanatory value of the two predictors taken together for healthy eating reaches 13.3%.

Policies aimed at supporting a healthy lifestyle also increase the variance by 1.9%, contributing to improved prediction (Δ R2 = 0.152, $F_{(3,708)}$ = 43.381, p = 0.000) and have a positive influence (β = 0.154, p = 0.000) on respondents' healthy eating (r = 0.239). This means that support for healthy practices coming from various policy levels leads to better outcomes for healthy eating.

Body dissatisfaction is the fourth significant potential predictor. It increases the variance by 1.4% when added to the model, improving its predictive value (Δ R2 = 0.166, $F_{(4,707)}$ = 36.408, p = 0.000), and exerts a significant negative impact (β = -0.152, p = 0.000) on levels of healthy eating (r = -0.275). The result indicates that reducing body dissatisfaction leads to increased healthy eating.

Finally, beliefs about the chronicity of overweight are the last potential predictor (β = 0.086, p = 0.016) that has a positive effect on the level of healthy eating (r = 0.030). It increases the variance by 0.6% and significantly improves the predictive value of the model (Δ R2 = 0.172, $F_{(5,706)}$ = 30.496, p = 0.000). The result suggests that beliefs about overweight as a long-term condition lead to an increase in healthy eating.

Unhealthy eating

The conducted analysis shows that significant predictors in the final model of unhealthy eating are: ***restrained eating*** (β = -0.338, p = 0.000), **food stimulated by taste and social situation** (β = 0.310, p = 0.000), **support for a healthy lifestyle from the family** (β = -0.143, p = 0.000), **stress** (β = 0.119, p = 0.000), and **support for a healthy lifestyle from organizational factors** (β = 0.108, p = 0.001). The adjusted coefficient of determination value (Δ R2 = 0.336, $F_{(5,706)}$ = 72.936, p = 0.000) indicates that 33.6% of the variance in unhealthy eating can be explained by the presented regression model (**Figure 16**).

Cognitive restraint in eating has the highest predictive weight in the current regression model and exerts a significantly negative influence (β = -0.338, p = 0.000). It contributes to 16.9% in explaining unhealthy eating (Δ R2 = 0.169, $F_{(1,710)}$ = 147.171, p = 0.000). This result shows that a decrease in control over eating behavior leads to an increase in the consumption of unhealthy food (r = -0.412).

Externally stimulated eating is the next significant potential predictor (β = 0.310, p = 0.000), contributing to approximately 12.4% of the variations in higher levels of unhealthy eating. This result indicates a tendency for people who are more susceptible to taste and hedonistic signals of food to consume more unhealthy food (r = 0.411). Adding this determinant increases the adjusted coefficient of determination (Δ R2 = 0.293, $F_{(2,709)}$ = 148.568, p = 0.000), helping in the prediction of 29.3% of the variations in higher levels of unhealthy eating.

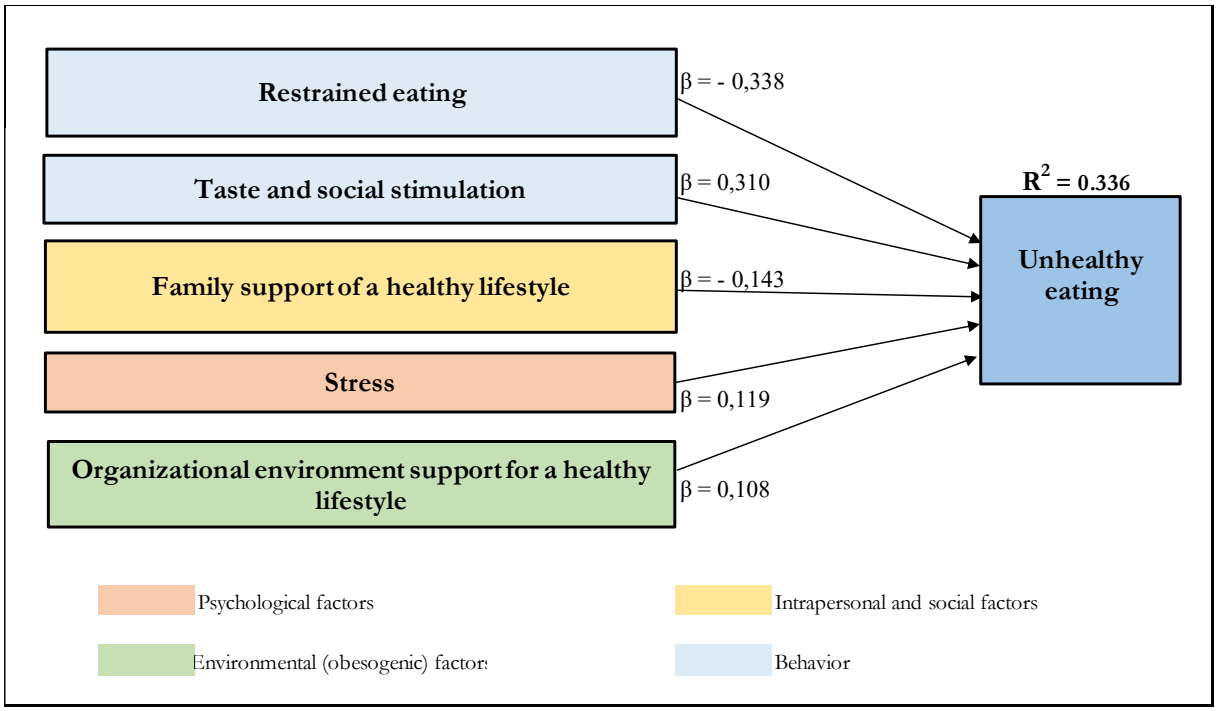

Figure 16: Significant effect of independent variables on unhealthy eating

Support for a healthy lifestyle from the family also increases the variance by 2.2%, contributing to improved prediction (Δ R2 = 0.315, $F_{(3,708)}$ = 110.188, p = 0.000), and negatively influences unhealthy eating of the respondents (β = -0.143, p = 0.000, r = -0.291). This result again verifies the significance of supportive family models and values related to the culture of eating. The trend here is reversed, as decreasing support for a healthy lifestyle from the family leads to increased unhealthy eating.

Stress is the fourth significant potential predictor. It increases the variance by 1.1% and further improves its predictive value when added to the model (Δ R2 = 0.326, $F_{(4,707)}$ = 86.780, p = 0.000). It has a significantly positive impact (β = 0.119, p = 0.000) on the levels of unhealthy eating (r = 0.237). This means that as stress levels increase, unhealthy eating also increases.

The support for a healthy lifestyle from the organizational environment is the last potential predictor (β = 0.108, p = 0.001) that has a positive effect on the degree of unhealthy eating (r = 0.037). It increases the variance by 1% and significantly improves the predictive value of the model (Δ R2 = 0.336, $F_{(5,706)}$ = 72.936, p = 0.000). This indicates that as organizational practices promoting a healthy lifestyle increase, unhealthy eating also increases. Despite the weak effect exerted by the predictor, this reverse trend is surprising and raises research interest.

Emotional Eating

Regarding emotional eating, seven variables have been identified as significant predictors: ***food stimulated by taste and social situation*** (β = 0.422, p=0.000), ***body dissatisfaction*** (β = 0.209, p=0.000), ***stress*** (β = 0.116, p=0.001), ***beliefs about the psychological factors of the state*** (β = 0.154, p=0.000), ***depressive symptoms (***β = 0.093, p=0.007), ***self-efficacy*** (β = -0.074, p=0.013), ***and Agreeableness*** (β = 0.058, p=0.044). Their combination significantly contributes to predicting emotional eating ($F_{(7,704)}$ = 90.875, p=0.000). The value of the adjusted coefficient of determination is R2 = 0.469. This indicates that 46.9% of the changes in emotional eating for the current sample can be explained by the presented regression model (**Figure 17**).

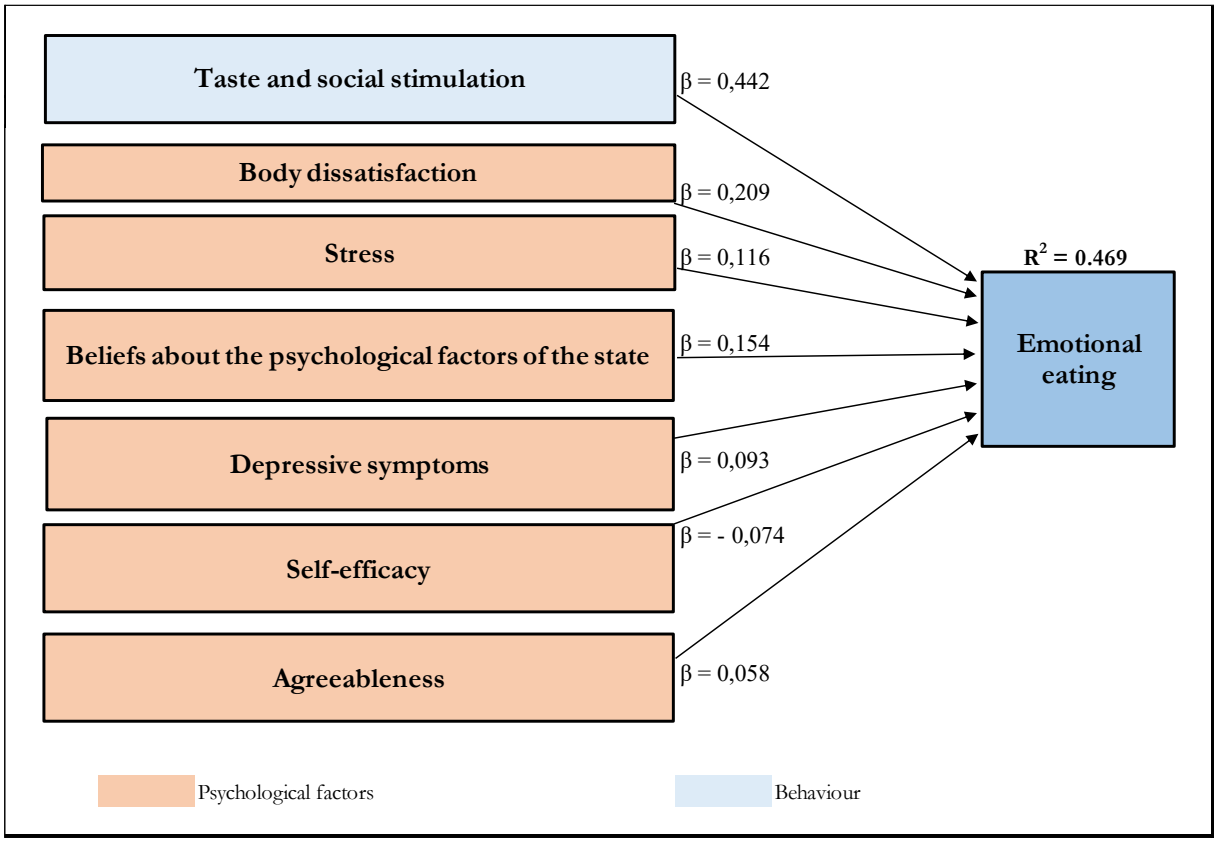

Figure 17: Significant effect of independent variables on emotional eating

Eating stimulated by food taste qualities and social situation has the highest predictive weight in the current regression model (β = 0.1442, p=0.000) and contributes to 34.2% of the

explanation of emotional eating (Δ R2=0.342, $F_{(1,710)}$ = 371.180, p=0.000). This result shows that as externally stimulated eating increases, emotional eating among respondents also increases (r = 0.586), indicating a tendency for individuals who are more reactive to external food-related signals to engage in more emotional eating.

Body dissatisfaction is the next significant predictor (β = 0.209, p=0.000), contributing approximately 6.4% and improving the predictive value of the model (Δ R2=0.406, $F_{(2,709)}$ = 243.719, p=0.000), explaining 40.6% of the variations in higher levels of emotional eating. This result demonstrates that increased body dissatisfaction leads to increased emotional eating (r = 0.419).

The third added predictor is stress, which increases the variance by 2.9%, contributing to improved prediction (Δ R2=0.435, $F_{(3,708)}$ = 185.355, p=0.000) and has a positive influence (β = 0.116, p=0.001) on respondents' emotional eating (r = 0.339). The regression model acknowledges the role of stress in this model and confirms its impact on eating behavior.

Beliefs about the psychological factors of overweight and obesity are included as the fourth significant potential predictor in the current model. It increases the variance by 2.1% when added to the model, further improving its predictive value (Δ R2=0.456, $F_{(4,707)}$ = 150.270, p=0.000) and exerts a significant positive effect (β = 0.154, p=0.000) on levels of emotional eating (r = 0.332). In other words, as beliefs that overweight is influenced by psychological factors increase, eating as a strategy for overcoming negative emotions also increases.

Depressive symptoms also increase variability by 0.8%, contributing to the improvement of prediction (Δ R2=0.464, $F_{(5,706)}$ = 124.111, p=0.000) and have a positive influence (β = 0.093, p=0.007) on emotional eating of the respondents (r = 0.335). The result shows that increased affective experience characteristic of depression can motivate food consumption.

Self-efficacy is also a significant predictor in the current model. It increases variability by 0.4% when added to the model, further improving its predictive value (Δ R2=0.467, $F_{(6,705)}$= 104.880, p=0.000) and has a significant negative impact (β= -0.074, p=0.013) on levels of emotional eating (r = -0.219). This means that decreasing subjective feelings of efficacy and control lead to increased emotional eating.

Agreeableness is the final potential predictor (β = 0.058, p=0.044) that has a positive effect on the degree of emotional eating (r = 0.041). It increases variability by 0.2% and significantly improves the predictive value of the model (Δ R2=0.469, $F_{(7,704)}$ = 90.875, p=0.000). This indicates that individuals with a more prominent personality trait of 'Friendliness' tend to eat as a result of emotional frustration.

Taste and social stimulation

It is found that the combination of the variables: ***emotional eating*** (β = 0.484, p=0.000), ***unhealthy eating*** (β = 0.258, p=0.000), ***physical activity*** (β = -0.100, p=0.001), ***positive affect*** (β = 0.117, p=0.000) ***and anxiety*** (β = 0.104, p=0.002) significantly predicts external eating ($F_{(5,706)}$ = 100.527, p=0.000). The adjusted coefficient of determination R2 is 0.435. This indicates that 43.5% of the variance in external eating in the current sample can be explained by the presented regression model (**Figure 18**).

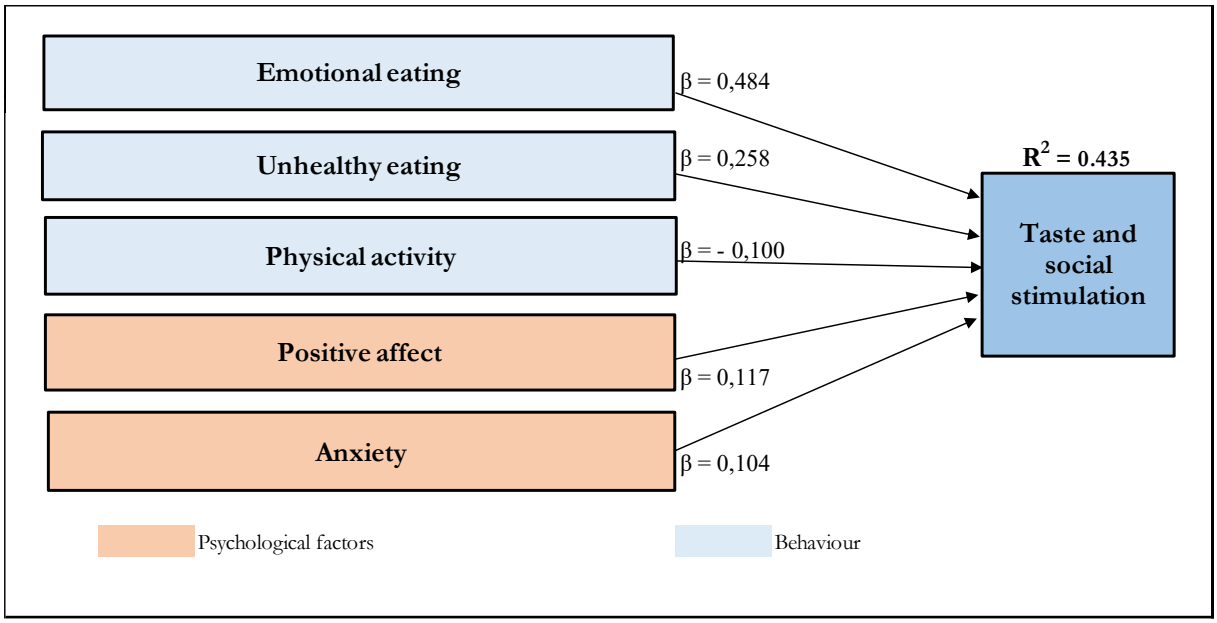

Figure 18: Significant effect of independent variables on taste- and socially-stimulated eating

Emotional eating has the highest predictive weight in the current regression model (β = 0.484, p=0.000) and contributes to 34.2% of the explanation of external eating (Δ R2=0.342, $F_{(1,710)}$ = 371.180, p=0.000). This result demonstrates a strong association between the two eating models (r = 0.586) and directs attention to the fact that individuals who eat more emotionally have a more pronounced tendency toward eating driven by sensory or social factors.

Unhealthy eating is the second significant predictor, contributing approximately 7.6% of the variation in higher values of external eating. It improves the model (Δ R2=0.418, $F_{(2,709)}$ = 256.064, p=0.000) and positively influences external eating in the respondents (β = 0.258, p=0.000). This means that respondents who engage in more unhealthy eating are likely to be more engaged in externally stimulated eating (r = 0.411).

Physical activity also increases variability by 0.6%, contributing to the improvement of prediction (Δ R2=0.424, $F_{(3,708)}$ = 175.364, p=0.000) and has a negative impact (β = -0.100, p=0.001) on external eating in the participants of the current sample (r = -0.267). The results suggest that decreasing levels of physical activity contribute to higher levels of eating that are not justified by physiological signals of hunger and satiety.

Positive affect is the next significant predictor. It increases variability by 0.4% when added to the model, further improving its predictive value (Δ R2=0.428, $F_{(4,707)}$ = 134.203, p=0.000) and exerts a significant positive influence (β = 0.117, p=0.000) on levels of external eating. This means that positive experiences can stimulate the consumption of food evaluated based on their culinary characteristics or eating motivated by social context.

Anxiety is the final potential predictor (β = 0.104, p=0.002) in the current model, which has a positive effect on the degree of external eating (r = 0.314). It increases variability by 0.7% and significantly improves the predictive value of the model (Δ R2=0.435, $F_{(5,706)}$ = 110.527, p=0.000). This indicates that increasing levels of anxiety enhance the tendency towards externally stimulated eating in the participants of the study.

Restrained eating

The regression model of cognitively limited eating includes nine variables that have been confirmed as significant predictors: ***unhealthy eating*** (β = -0.360, p = 0.000), ***physical activity*** (β = 0.236, p = 0.000), ***consciousness*** (β = 0.146, p = 0.000), ***beliefs about the seriousness of the condition*** (β = 0.126, p = 0.000), ***body dissatisfaction*** (β = 0.130, p =

0.000), ***neuroticism*** (β = 0.112, p = 0.001), ***friends support for a healthy lifestyle*** (β = -0.133, p = 0.000), ***family support for a healthy lifestyle*** (β = 0.112, p = 0.004) ***and supportive policies for a healthy lifestyle*** (β = 0.080, p = 0.017). Their combination significantly contributes to predicting limited eating ($F_{(9, 702)}$ = 33.632, p = 0.000). The value of the adjusted coefficient of determination is R2 = 0.292. This indicates that 29.2% of the variations in limited eating can be explained by the derived statistical regression model (**figure 19**).

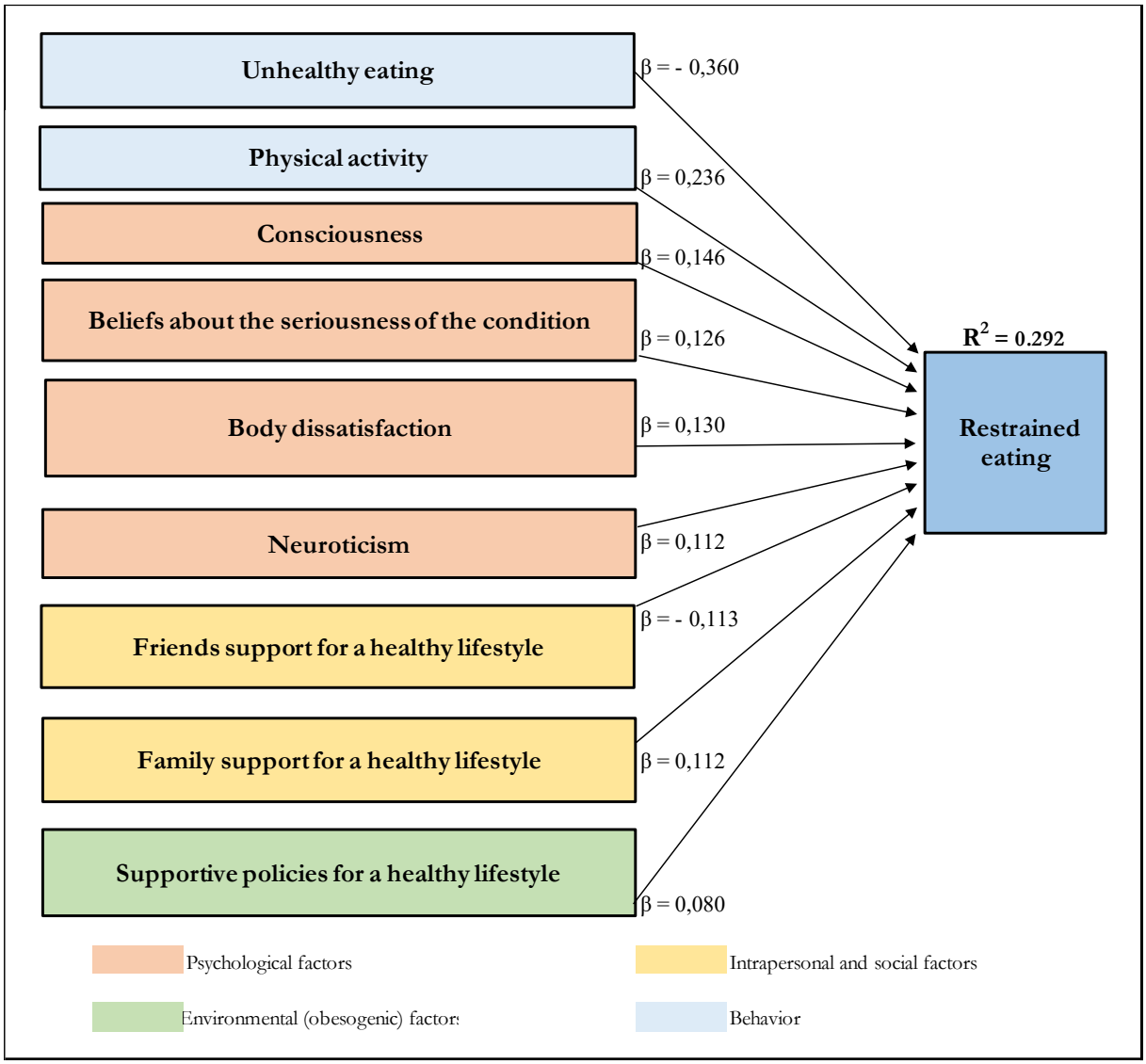

Figure 19: Significant effect of independent variables on restrained eating.

Unhealthy eating has the most significant predictive weight in the current regression model, negatively influencing limited eating (β = -0.360, p = 0.000). It accounts for 16.9% of the explanation of limited eating (Δ R2 = 0.169, $F_{(1, 710)}$ = 145.171, p = 0.000). This result shows that lower levels on the 'Unhealthy Eating' scale lead to increased levels of limited eating among respondents (r = -0.412).

Physical activity is the next significant potential predictor (β = 0.236, p ≤ 0.001), contributing approximately 4.1% to the variations in limited eating. This means that greater engagement in physical activities increases the level of limited eating (r = 0.291). By adding this variable, the adjusted coefficient of determination increases (Δ R2 = 0.210, $F_{(2, 709)}$ = 95.720, p = 0.000), and the explanatory power of the two predictors together for limited eating amounts to 21.0%.

The personality trait 'Consciousness' also enters the final regression model and increases the variance by 2.3%, contributing to an improvement in prediction (Δ R2 = 0.233, $F'_{(3, 708)}$ = 73.014, p = 0.000). It has a positive influence (β = 0.146, p = 0.000) on respondents' dietary behavior (r = 0.242). This result indicates that individuals who perceive themselves as more determined and persistent are more likely to exert control over their eating behavior.

The next significant potential predictor is beliefs about the seriousness of the condition (β = 0.126, p = 0.000), contributing approximately 1.7% (Δ R2 = 0.250, $F_{(4, 707)}$ = 60.324, p = 0.000) to the variations in limited eating. The result suggests that an increased belief that overweight carries serious consequences leads to increased control over eating (r = 0.177).

Body dissatisfaction is the fifth significant potential predictor in the current model. It increases the variance by 1.5% when added to the model, further improving its predictive value (Δ R2=0.265, $F_{(5,706)}$= 52.168, p=0.000), and has a significant positive impact (β = 0.130, p=0.000) on levels of dietary restraint (r = 0.088). The result shows that body dissatisfaction influences control over eating behavior.

Neuroticism also increases the variance by 0.8%, contributing to the improvement of prediction (Δ R2=0.273, $F_{(6,705)}$ = 45.535, p=0.000), and has a positive influence (β = 0.112, p=0.001) on respondents' restrained eating (r = 0.092). This result verifies the role of personality characteristics and their impact on adherence to specific eating behaviors. Specifically, increasing levels of neuroticism enhance dietary restraint.

Support for a healthy lifestyle from friends is also a statistically significant predictor of restrained eating. It increases the variance by 0.5% when added to the model, further improving its predictive value (Δ R2=0.278, $F_{(7,704)}$= 40.184, p=0.000) and has a significant negative impact (β = -0.133, p=0.000) on levels of this type of eating (r = -0.132). This result indicates a trend - decreasing support for healthy practices from the social environment influences higher levels of dietary control.

A reverse trend is observed for support for a healthy lifestyle from family, which is the eighth significant predictor in the regression model (β = 0.112, p=0.004). It contributes to approximately 1% (Δ R2=0.288, $F_{(8,703)}$= 36.878, p=0.000) of the variations in higher values for dietary restraint (r = 0.203).

Support for a healthy lifestyle policies is the last potential predictor (β = 0.080, p=0.017), which has a positive effect on the degree of dietary restraint (r = 0.122). It increases the variance by 0.4% and significantly improves the model's predictive value (Δ R2=0.292, $F_{(9,702)}$ = 33.632, p=0.000). Similar to healthy eating, this indicates that support for healthy practices coming from various policy-level regulations leads to increased dietary control.

Physical activity:

The presented regression model in **Figure 20** includes ten variables that significantly predict physical activity ($F_{(10,701)}$= 45.222, p=0.001): ***body dissatisfaction*** (β = -0.296, p=0.000), ***restrained eating*** (β = 0.204, p=0.000), ***support for a healthy lifestyle from the physical environment*** (β = 0.106, p=0.001), ***beliefs about the duration of the condition*** (β = -0.157, p=0.000), ***beliefs about the controllability of the condition*** (β = -0.120, p=0.000), ***healthy eating*** (β = 0.114, p=0.001), ***positive affect*** (β = 0.161, p=0.000), ***negative affect*** (β = 0.124, p=0.002), ***food taste and social situation*** (β = -0.091, p=0.005), and ***support for a healthy lifestyle from the organizational environment*** (β = 0.074, p=0.017). The value of the adjusted coefficient of determination is R2 = 0.383. This shows that 38.3% of the variations in physical activity can be explained by the constructed regression model.

The present regression model identifies body dissatisfaction as the predictor with the highest predictive weight (β = -0.296, p=0.000) for physical activity. It has a negative influence and accounts for 21.6% of the explanation(Δ R2=0.216, $F_{(1,710)}$= 196.873, p=0.000).

This result shows that lower levels of body dissatisfaction are associated with increased physical activity among respondents (r = -0.466) and highlights the significance of body image as a primary motivating factor for engagement in physical activity.

Restrained eating is the next significant potential predictor (β = 0.204, p=0.000), contributing to approximately 6.7% of the variations in higher levels of physical activity and significantly improving the model (Δ R2=0.283, $F_{(2,709)}$ = 141.028, p=0.000). This result indicates that individuals who exercise greater control over their food intake are more likely to engage in physical activity in their daily lives (r = 0.284).

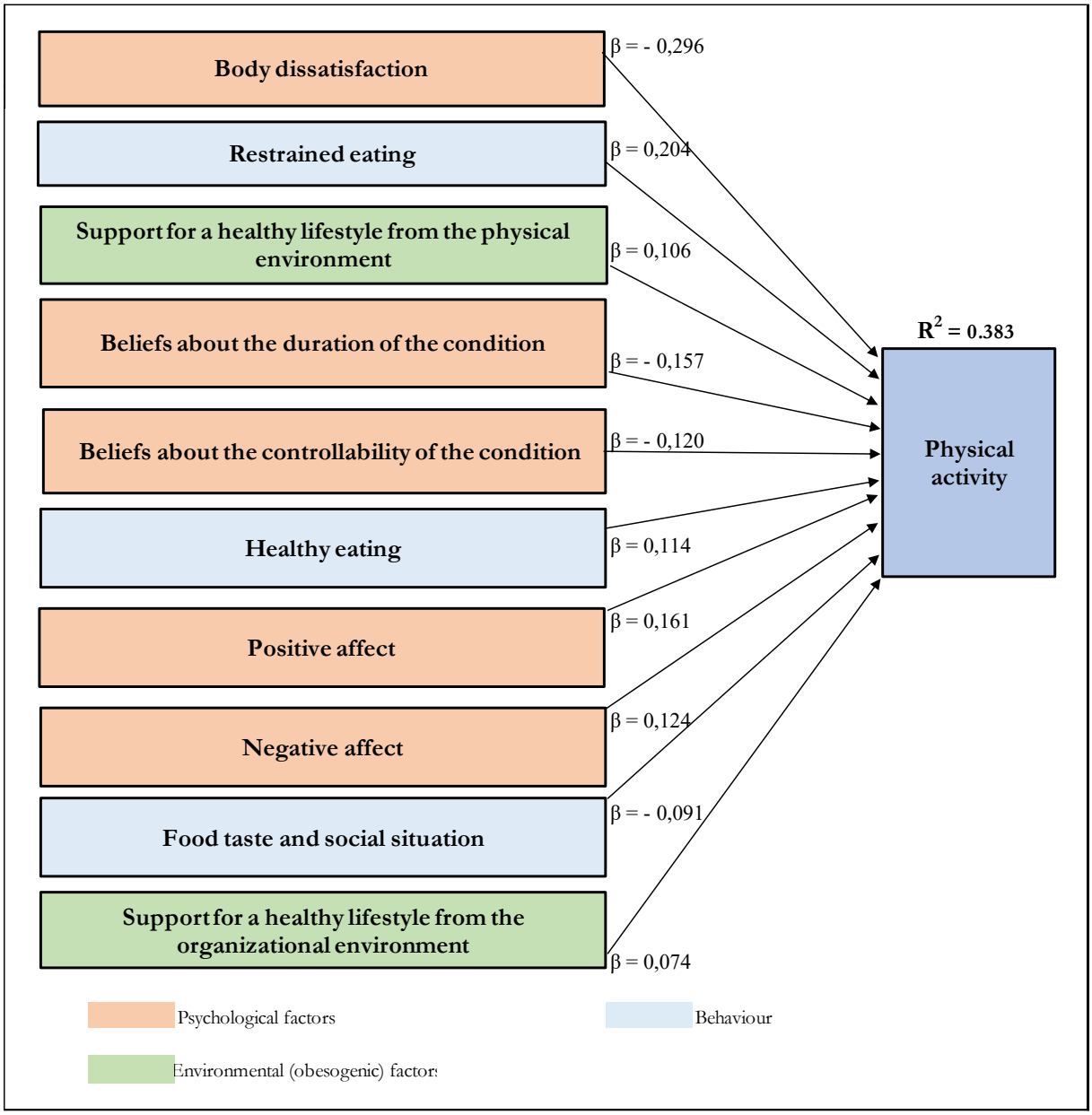

Figure 20: Significant effect of independent variables on physical activity.

Support for a healthy lifestyle from the physical environment is also a predictor that enters the final regression model and increases the variance by 2.9%, contributing to improved prediction (Δ R2 = 0.312, $F_{(3, 708)}$ = 108.642, p = 0.000). It has a positive impact (β = 0.106, p = 0.001) on the physical activity of the respondents (r = 0.299). This indicates that indirect support from the physical environment encourages the respondents and their level of physical activity increases.

The next significant predictor is beliefs about the duration of the condition (β = -0.157, p = 0.001). It has a negative influence and contributes to approximately 2.1% of the variations in higher levels of physical activity (Δ R2 = 0.333, $F_{(4, 707)}$ = 89.621, p = 0.000) (r = -0.241).

The next most important predictor, which also enters the final regression model and increases the variance by 1.4%, contributing to improved prediction (Δ R2 = 0.347, $F_{(5, 706)}$ = 76.517, p = 0.000), is the belief in the controllability of the condition. It has a negative influence (β = -0.120, p = 0.000) on the physical activity of the respondents (r = -0.243). In other words, reducing the belief that overweight is a constant state over time and is not under personal control leads to increased engagement in physical activity.

Healthy eating is the next significant potential predictor in the current model related to physical activity. It increases the variance by 1.4% when added to the model, further improving its predictive value (Δ R2 = 0.361, $F_{(6, 705)}$ = 67.874, p = 0.000), and has a significantly positive effect (β = 0.114, p = 0.000) on the levels of physical activity (r = 0.291). This result shows that individuals who adhere more strictly to a healthy eating regimen are more engaged in physical activities.

Positive affect also increases the variance by 0.6%, contributing to improved prediction (Δ R2 = 0.367, $F_{(7, 704)}$ = 59.888, p = 0.000) and has a positive influence (β = 0.161, p = 0.000) on the physical activity of the respondents (r = 0.258). Negative affect, a predictor with significant predictive value (β = 0.124, p ≤ 0.001) for physical activity, also increases the variance by 0.6% and improves the prediction (Δ R2 = 0.373, $F_{(8, 703)}$ = 53.824, p = 0.000). Increasing the levels of both positive and negative affect positively influence and contribute to increased physical activity. This result indicates the influence of the emotional context on the engagement of the participants in physical activity, without associating it with a specific dominant tendency.

External food stimulation is also a statistically significant predictor of physical activity. It increases the variance by 0.6% when added to the model, further improving its predictive value (Δ R2=0.379, $F_{(9,702)}$ = 49.550, p=0.000), and has a significant negative impact (β = -0.091, p=0.005) on the levels of physical activity. These data indicate that participants reporting lower values on the 'Taste and social stimulation' scale tend to improve their levels of physical activity (r = -0.267).

Support for a healthy lifestyle from the organizational environment is the final potential predictor (β = 0.074, p=0.017) that has a positive effect on the degree of physical activity. It increases the variance by 0.4% and significantly improves the predictive value of the model (Δ R2=0.383, $F_{(10,701)}$ = 45.222, p=0.000). This model once again highlights the influence of organizational policies and practices. Unlike the observed trend in healthy eating, here they have a stimulating effect and increase the levels of physical activity (r = 0.205).

6.6. Effect of Eating Behaviour and Physical Activity on BMI

Stepwise regression analysis was used to examine the effect of eating behaviour and physical activity on body weight as measured by body mass index (BMI). A multiple stepwise regression analysis was conducted with BMI as the dependent variable, and eating behavior and physical activity as the independent variables **(Figure 21).**

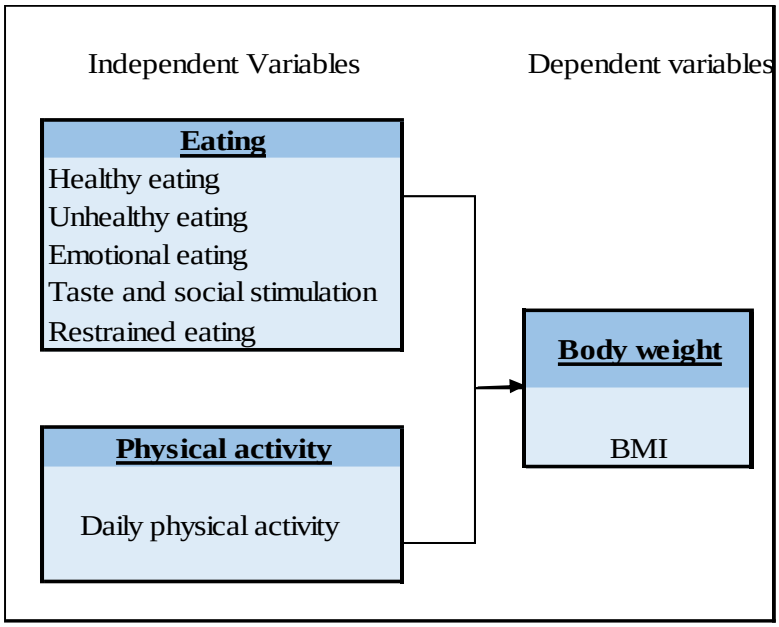

Figure 21: Dependent and independent variables - second regression model

Table 15 presents the statistically significant results of the analysis.

Table 32: Effect of Eating Behavior and Physical Activity on BMI

BMI				
	B	T	P	Adjusted R^2
Physical Activity	-0,416	-12,573	0,000	0,273
Emotional Eating	0,231	6,983	0,000	

The results indicate that physical activity (β = -0.416, p=0.000) and emotional eating (β = 0.231, p=0.000) are potential predictors for predicting BMI. The analysis reveals that the combination of these variables significantly predicts higher levels of BMI ($F_{(2,709)}$ = 134.527, p=0.000). The adjusted coefficient of determination, R2, is 0.273. This indicates that 27.3% of the variance in higher BMI levels can be explained by the presented regression model **(Figure 21).**

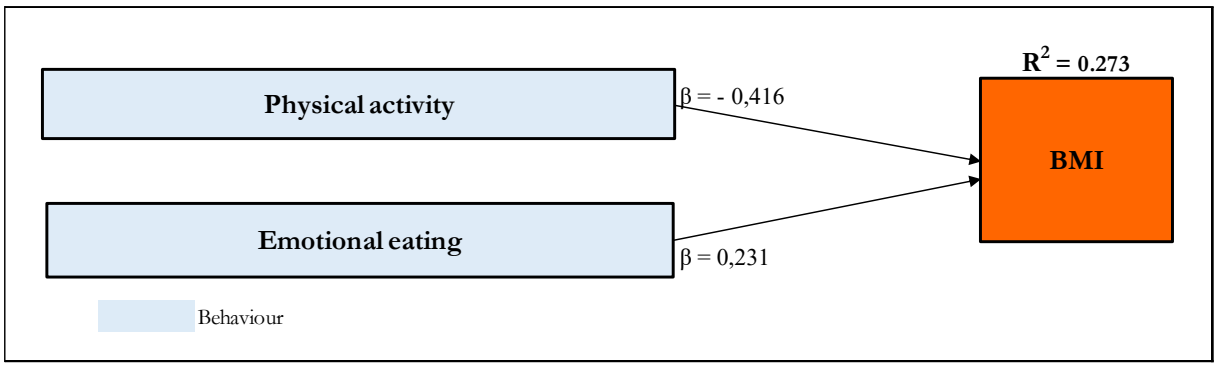

Figure 21: Significant effect of physical activity and emotional eating on BMI

Physical activity is the predictor with the highest predictive weight (β = -0.416, p=0.000) for BMI, contributing to 22.4% of its variance (Δ R2=0.224, $F_{(1,710)}$= 206.415, p=0.000). This result shows that low levels of physical activity are associated with weight gain (r = -0.475) and highlights the central role of movement in maintaining a healthy weight.

Emotional eating is the other predictor included in the final regression model, increasing the variance by 4.9% and significantly improving the prediction (Δ R2=0.273, $F_{(2,709)}$= 134.527, p=0.000). It has a positive influence (β = 0.231, p= 0.000) on increasing respondents' BMI levels (r = 0.337). This means that increasing emotional eating leads to weight gain.

SUMMARY AND CONCLUSION

The topic of the dissertation study is widely covered and discussed in the modern world. Its relevance is due to the epidemiological increase in overweight and obesity. The consequences of these conditions are associated with a number of risks to subjective well-being and pose a serious challenge to the public healthcare system. The present scientific work aims to explore and further understand the factors that contribute to excessive weight gain beyond healthy limits.

Based on the literature review, a research model and instrument tools have been developed, encompassing the multidimensional structure of the investigated problem. The analysis of the psychometric characteristics of the questionnaires and scales used demonstrates high validity and internal consistency, enabling the application of statistical procedures to examine the relationships between the studied phenomena.

The differentiating effect of sociodemographic characteristics on eating behavior and physical activity reveals some significant tendencies:

- Higher levels of **healthy eating** were reported among individuals with higher education, those living in the capital and major cities and respondents with families.
- **Unhealthy eating** showed higher levels among younger participants, individuals with secondary education and low-income individuals.
- Higher values on the '**Emotional Eating**' scale were found among women, individuals with higher education, and those living in small towns, with a tendency towards this eating pattern increasing with age.
- **Eating driven by taste preferences and/or social situations** was more prevalent among respondents with higher education.
- Higher levels on the '**Restrained Eating'** scale were registered among women and respondents with the highest monthly incomes.
- **Physical activity** was higher among men, younger participants, individuals with secondary education, and those without chronic illnesses.

From the analysis of variance, several trends related to dietary behaviour and physical activity among participants, distributed according to BMI are evident:

- Individuals with **obesity** showed the highest levels of unhealthy eating, emotional eating and externally driven eating, as well as the lowest levels of healthy eating, physical activity and cognitive restraint.
- **Overweight** respondents reported higher levels of emotional eating and lower physical activity compared to respondents with normal weight. This group consumed more unhealthy food and exhibited a higher degree of eating driven by taste and hedonistic cues compared to respondents with normal weight. Additionally, the highest levels of dietary restraint were observed in this group.
- The observed trend in dietary behaviour among individuals with **normal weight** showed the lowest levels of unhealthy eating and eating driven by taste and social situations, lower levels of emotional eating, and higher average values on the scales for healthy eating, dietary restraint and physical activity (compared to the overweight and obesity group).

- The group of individuals with **below-normal weight** exhibited the highest levels of healthy eating and physical activity, as well as the lowest levels of emotional eating according to the 'Emotional Eating' scale.

The results of the current study partially confirm the assumptions made with *Hypothesis 3*, that individuals with overweight and obesity will experience higher levels of negative affective experiences and states, body dissatisfaction, beliefs of lack of behavioral control over weight, as well as lower scores on the scales of 'Overall Life Satisfaction,' 'Social Support for a Healthy Lifestyle,' and 'Support for a Healthy Lifestyle from the Environment.' The conducted analysis of variance shows that these assumptions are relevant to individuals with obesity, but not all of them are applicable to respondents with overweight. The main difference between the two groups lies in the emotional domain, where the observed trends are opposite. Individuals with overweight exhibit the lowest levels of stress, depressive symptoms, and anxiety, while in individuals with obesity, the values on these dimensions are significantly higher.

A series of correlation and regression analyses have been conducted to examine the relationship between the studied phenomena and their influence on eating behavior, physical activity and weight.

To summarize the correlation analyses, some trends related to the interrelationships between the studied phenomena can be identified. Firstly, the results indicate that the studied behaviours cluster together. Eating patterns associated with overweight and obesity (unhealthy, emotional and external eating) are positively correlated with each other. They also negatively interact with healthy eating, cognitively limited eating and physical activity, which the analysis of variance associates with weight above and below the norm (according to BMI). Several previous studies establish a similar relationship between eating patterns, daily diet, and physical activity (van Strien, 1996; Stroebe et al., 2008; Joseph et al., 2011; Boswell & Kober, 2016; Devonport et al., 2019 Bui et al., 2021). This means that one eating behaviour from the negative cluster is likely to be accompanied by other eating styles associated with overweight and obesity. On the other hand, healthy eating, cognitively limited eating and physical activity form another triad. There is a positive correlation between these behaviors, reflecting the relationship of a healthy diet with the ability to control food intake and engagement in physical activity.

Subsequent analyses reveal interrelationships that confirm this bidirectionality. The first set of eating behaviors is positively associated with negative affect, depressive symptoms, anxiety, stress, and body dissatisfaction. As negative emotions increase, eating behavior, most commonly associated with overweight and obesity, also increases. In the case of healthy eating and physical activity, the trend is reversed. These behaviors show a negative correlation with negative emotional states and body dissatisfaction, while no significant correlations with emotional components are found for limited eating. Regarding self-efficacy, life satisfaction, social support for a healthy lifestyle from family, friends, and contextual factors, the pattern is the same. Unhealthy, emotional and taste-driven eating are negatively correlated with these constructs, while healthy eating, limited eating and physical activity exhibit positive correlations.

Among the five personality traits, the most pronounced relationship is observed between eating behaviour, physical activity, 'Conscientiousness/Goal-Directedness,' and 'Neuroticism.' The obtained results negatively link conscientiousness with eating behaviours associated with weight gain and positively with the other set of behaviors - healthy eating, physical activity and limited eating. In the case of neuroticism, the tendency is exactly the opposite. It is positively associated with unhealthy, emotional, and externally driven eating and negatively correlated with healthy eating and physical activity. The current findings are consistent with previous data in the scientific literature, which often establish a relationship

between these two personality traits, eating behaviour and weight (Terracciano et al., 2009; Sutin et al., 2011; Jokela et al., 2013; Gerlach, 2015

In order to test the hypothesis regarding the significant effect of psychosocial and contextual correlates on eating behaviour and physical activity, a series of regression analyses were conducted. The obtained results confirm the influence of factors from different levels according to the Ecological model. Healthy eating can be directly and/or indirectly influenced by factors at the social/interpersonal and ecological levels. Regarding unhealthy eating, the influence of family food patterns with a negative sign and the role of stress have been observed, pointing to possible topics and levels for consultative work. The regression analysis of emotional eating includes negative emotional states as primary correlates in the model, emphasizing the need for individual psychological work related to emotional regulation (understanding, processing and controlling emotions). The model of eating, stimulated by sensory and hedonic signals, introduces and suggests that not only negative emotions can have a destabilizing effect on eating behaviour. The results show that positive affect has a predictive role in increased food consumption, stimulated by the taste cues of food. Regarding restrained eating, the regression equation reveals factors from different levels of influence and acknowledges a negative relationship with unhealthy eating and a positive relationship with physical activity. In the present study, the eating pattern of 'Restrained eating' is more strongly associated with a positive tendency regarding its connection to other investigated behaviours and weight. The regression model of physical activity points to the supportive role of environmental factors and outlines the importance of body image, conscious control over eating, healthy eating, and beliefs related to overweight. According to the results of the regression model of BMI (Body Mass Index), two behavioural tendencies have a direct effect on weight gain - decreased physical activity and higher levels of emotional eating. The results provide a basis to suggest that promoting physical activity and emotional regulation are crucial for weight management.

GUIDELINES FOR PREVENTIVE, CONSULTATIVE AND PSYCHOTHERAPEUTIC PRACTICE

One of the aims of this research work is to provide practical guidelines for working in the field of the investigated issue, supported by empirical evidence. The scope of the study and the obtained results allow for recommendations to be made for possible interventions at various levels related to overweight and obesity - individual, social and contextual.

Promotion of Health and Prevention of Overweight and Obesity

When discussing the promotion and prevention of healthy behaviour, the influence of sociodemographic characteristics and contextual factors such as economic status, family values and models, obesogenic environment, etc., cannot be ignored. Dietary patterns and levels of physical activity are key behaviours related to health, overweight and obesity. The results of this study suggest the need for interventions aimed at promoting health and preventing overweight and obesity to focus on supporting a healthier dietary regimen among young people and a more active lifestyle among older individuals. Another significant result related to the differentiating effect of sociodemographic characteristics indicates that people with low incomes and those residing in small settlements have unhealthier eating habits. This leads to social inequalities in the Bulgarian context and highlights the need for regional and national policies related to equal access to healthy and diverse food.

The study highlights the importance of social environment and contextual factors in shaping dietary habits and increasing physical activity. The choice of a healthy or unhealthy

diet can be directly or indirectly influenced by family traditions and eating models. These results suggest that preventive work to tackle the obesity epidemic should include work with the family system, particularly regarding children's eating habits. Possible instruments for indirect influence can be supportive contextual factors or direct informative programs aimed at increasing knowledge about the benefits and risks of eating behavior. The results of the conducted statistical analyses support the proposed approach, showing a positive association between a healthy diet and supportive factors at the organizational, physical, and political levels, as well as the direct effect of policies supporting a healthy lifestyle.

In the present study, physical activity increases in the presence of supportive environmental factors, once again emphasizing the influence of context on individual engagement in health behavior. The results outline a potential strategy in the fight against overweight and obesity at the community level. Interventions aimed at promoting physical activity should include the enhancement of physical living spaces, the construction and maintenance of sports facilities with free access (outdoor fitness areas, playgrounds for various sports - football, basketball, volleyball, etc., sports halls in institutional settings), promotion of active transportation, etc.

Individual Level Interventions

Social and contextual level interventions are more related to preventing the spread of overweight and obesity, forming and supporting healthy eating habits, and increasing physical activity. Consultative and psychotherapeutic work addresses individual-level characteristics. The results of this study support certain recommendations in this direction.

Comparative analyses of groups formed according to BMI reveal a distinct trend among people with obesity regarding their eating behavior and physical activity. They exhibit the highest levels of unhealthy emotional and external eating and the lowest levels of healthy eating, physical activity, and cognitively limited eating. These results provide a basis for focusing efforts with individuals suffering from obesity on:

- Increasing knowledge about foods and healthy eating
- Encouraging physical activity (compatible with individual physical capabilities)
- Exploring emotional experiences and building healthy emotional regulation strategies
- Enhancing self-control over eating behaviour
- Boosting self-efficacy

At the behavioral level, similar trends have been identified among individuals with overweight but they significantly differ from participants with obesity in terms of dietary control, which is highest among them.

The results obtained from subsequent dispersion analyses related to differences in psychological, social and environmental factors according to BMI provide additional information and enrich the picture related to obesity and overweight. These findings bring clarity on potential root causes in dietary practices and can support the development of effective individual strategies that take into account social and personal influences.

At the belief level, individuals with obesity exhibit the highest levels of beliefs that weight issues are constant and related to psychological factors, as well as that they are not dependent on lifestyle. These beliefs can potentially demotivate behaviours related to weight reduction, such as adhering to a healthy diet or dietary restrictions and engaging in physical activity. The obtained results suggest that prevention and interventions for reducing overweight can be more successful by rethinking beliefs and possibilities for behavioral weight control.

In the studied individuals with obesity, the highest levels of depressive symptoms, body dissatisfaction and significantly higher stress, anxiety and negative affect have been registered compared to respondents with normal and overweight. These results may explain

the higher levels of emotional eating and can be used as a direction for therapeutic work related to emotions and emotional regulation.

The comparative analyses differentiate participants with overweight and obesity in terms of emotions. The former have the lowest levels of depressive symptoms, anxiety and stress. Based on the results that indicate individuals with overweight have the highest levels of dietary eating and the lowest scores on scales for depressive symptoms, stress and anxiety (emotional states associated with emotional eating), it can be assumed that the primary focus of weight reduction interventions for overweight individuals should be on promoting physical activity.

Another important practical result is that the observed behaviours cluster together. Healthy, cognitively limited eating and physical activity are positively correlated with each other and negatively correlated with unhealthy, emotional and externally triggered eating. This implies that modifying one of the behaviors related to weight maintenance within healthy limits can trigger changes in the rest of the behaviors in this chain and limit the consumption of unhealthy foods and overeating.

Regression models also outline a direction for consultative and therapeutic interventions. The results highlight different influence trends concerning emotions. Depressive symptoms and stress are predictors of emotional eating. Stress is involved in the regression model of unhealthy eating, while anxiety has a predictive impact on eating stimulated by taste characteristics of food and/or social situations.

Last but perhaps the most important according to the results of this study, promoting physical activity and emotional regulation are the key factors in the prevention and treatment of overweight and obesity. This implies that individuals with excess weight require a more comprehensive care approach, not only focusing on dietary prescriptions but also addressing their mental well-being. Developing an individualized plan that considers their physical capabilities and supporting physical activity is crucial for these individuals.

SCIENTIFIC FINDINGS OF THE STUDY

The dissertation work contributes to a deeper theoretical understanding of the investigated issues. The obtained results draw attention to the differences between participants with overweight and obesity in terms of psychosocial correlates and levels of control over food intake. Additionally, this study broadens the scope of examined variables related to eating behavior and physical activity, by adding psychological, social, and contextual determinants. This allows for a more comprehensive investigation of significant predictors for healthy, unhealthy, emotional, externally triggered, and limited eating, as well as for physical activity. Furthermore, new quantitative scales have been constructed operationalizing eating behavior, support for a healthy lifestyle from significant social environment, organizational, physical environment, and policies.

STRENGTHS AND LIMITATIONS OF THE STUDY

Alongside its advantages related to the broad scope of the study and the ability to trace the interrelationships and effects of multiple factors, the methodology's volume poses limitations. Participation in the study takes approximately 25-30 minutes on average, which some participants lack the patience and/or desire to allocate. Criticism accompanying data collection is that the methodology is extensive. Some respondents report that this discouraged them from completing the questionnaires.

Another limitation of the study is related to the sample, which is not gender-homogeneous. For a more comprehensive picture of the studied phenomena and generalizing the results to the entire population, a more representative representation of male participants is

necessary. Underweight individuals in the study are significantly fewer compared to respondents with normal, above-normal weight, and obesity. This implies careful interpretation of results from comparative analyses.

Another limitation of the research is the absence of an objective criterion for assessing the social and environmental support for a healthy lifestyle among participants. Such an assessment could provide information about how subjective perception may vary compared to the objective environment.

Despite these limitations, the conducted study contributes to a deeper understanding of the relationships between the examined theoretical constructs and the effect of psychosocial correlates on eating behavior, physical activity, overweight, and obesity.

DIRECTIONS FOR FUTURE RESEARCH

The obtained results fail to answer the question of why the percentage of men with overweight and obesity on a global scale is higher. The current and previous studies establish that individuals of the male gender are more active, while women tend to be influenced by negative emotions in their eating behaviors. In the present study, it was assumed that unhealthy and externally triggered eating would be at the core of weight gain in men. However, the results do not indicate statistically significant differences between genders concerning these eating patterns, leading to the rejection of the hypothesis. Perhaps the trend towards dietary restrictions, more characteristic of women, is related to the observed worldwide tendency, but further research is needed.

Deeper investigations are needed regarding the role and relationship between positive emotions and eating behavior. The current study's results indicate that positive affect is a predictor of externally triggered eating, suggesting that not only emotions with negative connotations can have a disinhibiting effect on eating behavior.

Another interesting finding is the positive relationship between unhealthy eating and supportive practices of a healthy lifestyle in the organizational environment. According to the Ecological Model's theoretical framework, the expectation would be for the opposite trend. Detailed studies are needed for the Bulgarian sociocultural context to understand interaction mechanisms and possible mediating influences.

In conclusion, the current dissertation study on psychosocial correlates provides a strong foundation for developing evidence-based intervention programs - a logical step and guidelines for more in-depth research on the effectiveness of such interventions.

REFERENCE TO THE SCIENTIFIC CONTRIBUTIONS OF THE STUDY

The scientific contribution of the dissertation work can be acknowledged on methodological, empirical, and practical levels.

1. A review of psychological theories related to overweight and obesity over the past decades was conducted, justifying the applied integrative methodological framework for studying the issue.
2. To this date, this is the first study in Bulgaria that includes correlates from different levels of influence according to the Ecological Model. The gathered data through the developed methodology allow the expansion of the research scope by adding and analyzing social and contextual influences alongside individual characteristics related to weight gain.
3. Aligned with the study's purpose and based on an in-depth review of specialized literature, three new questionnaires were developed that operationalize daily dietary patterns (healthy and unhealthy eating), supporting social and contextual factors. This

enables the collection and analysis of quantitative data for the studied theoretical constructs and empirically evaluating the interrelation between social and environmental factors, eating behavior, physical activity, and weight.

4. The study's results enrich empirical knowledge about the influence of sociodemographic characteristics on eating behavior and physical activity. Additionally, the research establishes differences in eating behavior, physical activity, and psychosocial factors based on BMI classifications.
5. The realized study deepens empirical understanding of the predictive role of individual, social, and contextual factors for each of the studied eating behaviors and physical activity. Importantly, it identifies behaviors that have a direct effect on weight gain.
6. The empirically generated knowledge and established trends from the conducted research hold potential practical value in preventive interventions aimed at public health, as well as in consultative and psychotherapeutic work related to individuals affected by overweight and obesity.

LIST OF PUBLICATIONS

Pandurova, P., Karabeylova, S. (2020). The relationship between body image dissatisfaction and attitudes towards eating. Proceedings of the Third National Congress on Clinical Psychology with International Participation, Sofia, Steno Publishing, 2020, pp. 305-320.

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Pandurova, P. (2023). Strengthening children's ego through methods of symbolic play. Journal of Psychodrama and Sociometry, Springer (in press).

PARTICIPATION IN SCIENTIFIC FORUMS AND PROJECTS

Forum Name: EHPS 2021: 35th Annual Conference of the European Health Psychology Society Dates: August 23, 2021 - August 27, 2021 Poster Title: Weight-related Health Beliefs in Adolescents and Young Adults.

Forum Name: CBC 2021: Conference Enabling Behaviour Change to Build Back Better for Health and Sustainability Dates: November, 1st, 2021 – November, 3rd, 2021 Poster Title: 'Social Factors Associated with Eating Behaviors.'

Forum Name: CBC 2021: Conference Enabling Behaviour Change to Build Back Better for Health and Sustainability Dates: November 1, 2021 - November 3, 2021 Poster Title: Environmental Factors Associated with Physical Activity.

Project: 'Overweight - a Factor of Adversityt/Well-being,' Faculty of Philosophy, Sofia University 'St. Kliment Ohridski,' Scientific Research Fund, Supervisor: Prof. Sonya Karabeliova, 2020, completed.

Project: 'Life Online - The New Normality. Characteristics, Challenges, and Sociocultural Differences,' Basic Organization Sofia University 'St. Kliment Ohridski,' Scientific Research Fund, Supervisor: Assoc. Prof. Dr. Nadezhda Zhechkova.

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