

# *Time perspective, future anxiety, and hope for success in individuals awaiting bariatric surgery*

## BACKGROUND

The paper focuses on the problems of temporal functioning of obese individuals and of individuals prepared for bariatric treatment. The experience of time heavily weighs on many areas of human functioning, everyday activity, planning and achieving goals, engaging in pro-health behaviours, and in consequence on the quality of life and on physical health. Contingent on numerous factors, obesity may be related to focusing on particular aspects of time perspective. The aim of the study was to determine the specificity of particular temporal dispositions in individuals prepared for bariatric surgery, and thus to devise suitable post-op psychological interventions.

## PARTICIPANTS AND PROCEDURE

The study sample comprised 28 individuals (60.7% women, mean age  $M = 43.82$  years,  $SD = 10.01$ , mean BMI  $M = 44.83$  kg/m<sup>2</sup>,  $SD = 6.51$ ) awaiting bariatric surgery. The data were collected individually with the following pen-and-paper questionnaires: the Zimbardo Time Per-

spective Inventory, the Dark Future Scale, and the Polish adaptation of Snyder's Adult Hope Scale, which is named the Hope for Success Questionnaire.

## RESULTS

The results showed the prevalence of present hedonistic time perspective in the obese. With regard to future anxiety or the hope for success, no significant deviations from the general population were observed.

## CONCLUSIONS

The results indicate that this group is in need of temporal psychotherapy aimed at balancing the time perspective. The results may also be interpreted through the lens of contextual determinants connected with task orientation preceding the surgery.

## KEY WORDS

obesity; bariatric surgery; time perspective; hope; future anxiety

ORGANIZATION – 1: Institute of Applied Psychology, Jagiellonian University, Krakow, Poland · 2: 2<sup>nd</sup> Department of General Surgery, Jagiellonian University Medical College, Krakow, Poland

AUTHORS' CONTRIBUTIONS – A: Study design · B: Data collection · C: Statistical analysis · D: Data interpretation · E: Manuscript preparation · F: Literature search · G: Funds collection

CORRESPONDING AUTHOR – Kinga Tucholska, Ph.D., Institute of Applied Psychology, Jagiellonian University, 4 Łojasiewicza Str., 30-348 Krakow, Poland, e-mail: kinga.tucholska@uj.edu.pl

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## BACKGROUND

Obesity is a very serious health issue that is classified as a disease of civilization. It is related to an increased risk of suffering from type 2 diabetes, hypertension, cardiovascular diseases, and other metabolic disorders, as well as from resulting conditions, including complications of diabetes, such as the earlier onset of cataract, 'diabetic foot', or kidney failure (Hruby et al., 2016). Adipose tissue is thought to take an active part in a number of metabolic, hormonal and immune processes. Obesity and obesity-related chronic inflammation lead to many metabolic and autoimmune disorders (Artemniak-Wojtowicz et al., 2020). As a risk factor, inflammation is related to circulatory system diseases, including coagulation disorders, atherosclerosis, metabolic syndrome and insulin resistance, as well as to other diseases that are not related to cardiovascular disorders, such as psoriasis, neoplasms and kidney diseases (Ellulu et al., 2017). The most recent data indicate that obesity is also related to an aggravated course of SARS-CoV-2 infection (Rebello et al., 2020). The obese tend to significantly more often suffer from depressive and anxiety disorders. All these factors translate to increased mortality rates, and to other adverse social and economic effects. Many obese people remain unemployed and receive healthcare and/or social benefits, which add up to even more spending as the costs of treatments for coexisting conditions are very high. Consequently, it is essential to identify both the mechanisms underlying obesity and the factors that are key to prophylaxis and to therapeutic effectiveness. Bariatric surgery does not guarantee long-lasting effects in curing obesity unless the patients subjected to the procedure drastically change their regimen. That is why finding effective supplementary psychological interventions for this group is not only particularly important, but also expected and hoped for by the patients and healthcare providers. In this study, we verify to what extent personality temporal variables, such as type of time perspective, or hope and future anxiety levels, allow the obese to be differentiated against the general population. Understanding the intricacies of their attitude towards, and their experience of time dimensions (the future, the present, the past) will contribute to more effective psychological interventions in this group.

### THE PROBLEM OF OBESITY

The epidemiological data from 2013 show that obesity growth is observed worldwide (Brończyk-Puzoń et al., 2014). The increasing tendency applies also to children and youth. According to the World Health Organization (WHO), the percentage of obese people worldwide has almost tripled since 1975. The majori-

ty of the world population lives in countries in which overweight and obesity kill more people than underweight. This fact was one of the reasons for the WHO to classify obesity as the epidemic of the 21<sup>st</sup> century.

Obesity can be prevented and reduced through appropriate lifestyle – healthy, appropriate nutrition corresponding to the needs of the body, physical activity, as well as weight monitoring. However, in the case of the obese, surgery is often the sole remedy for further weight growth. Obesity is rooted in many intramental and interpersonal factors. Because in most cases it is the effect of overeating, and not of metabolic dysfunctions, the search for causes focuses on behavioural determinants of obesity. The following four causes have been identified (Aamodt, 2016):

1. Decreased interoceptive sensitivity (sensitivity to internal states of the body) – individuals who are not obese use bodily cues (such as hunger, satiety, or other sensations) to regulate nutritional behaviours, while the obese tend to depend on such external cues as the time of the day or presence of tasty food within their reach.
2. Reaction to experienced emotional tension – the obese attempt to cope with stress and regulate their emotional states with the help of food, which results in overeating. In the course of their life experiences, they have learnt that eating reduces their anxiety, and in situations charged with negative emotions, they resort to food as a means of relieving the tension and lifting the mood. This, in turn, leads to formation of a vicious circle as gaining weight causes a negative emotional backlash that leads to emotional eating.
3. Cognitive control dysfunctions have been observed in situations when an individual refraining from food breached a dietary routine, which resulted in subsequent overeating (it was irrelevant whether it was an actual breach or just the individual's belief). Self-control is susceptible to a number of regulatory biases stemming from stress, distractions, and threats to self-esteem.
4. Individual biological differences in, among other factors, the so-called protected weight range, within which the body vies to maintain itself by impelling people on a diet to overeat, and thus to return to their previous weight.

Making hasty decisions regarding nourishment, poor behavioural control, disinhibition and misjudgement regarding behaviours offering immediate gratification (overeating) may be determined by disturbances in functional brain networks (Donofry et al., 2019), especially those related to self-regulation, reward evaluation, self-directed thinking and homeostatic control. Weight-related differences in task-evoked and resting-state connectivity have most frequently been noted in the executive control network (ECN), salience network (SN) and default mode network (DMN), with obesity being generally asso-

Kinga Tucholska,  
Bożena Gulla,  
Anna Grabowska,  
Piotr Major

ciated with weakened connectivity in the ECN and enhanced connectivity in the SN and DMN. There is emerging evidence that disruptions of networks involved in salience detection, self-referential thought, reward processing and executive control may be related to eating patterns that promote obesity. The relationship between obesity and functional connectivity of particular areas, however, is most complex and requires further research.

Among the interpersonal factors underlying obesity, the most prominent are thought to be the nutritional patterns of parents (which model the progeny's future behaviours), the direct formation of nutritional behaviours of children (by means of food quality and distribution), family traditions, as well as the feedback on children's weight and figure. The levels of chronic intrafamilial stress are also not to be overestimated. The quality of social bonds, overweight acceptance, and the patterns of spending time together may also contribute to overeating (Spence, 2018).

Usually, the psychosocial standing of the obese is unfavourable – many of them are dependent on their families or social services, they have a hard time finding a job, and their social life is severely limited, with some being unable to start a family or have children, while others are incapable of taking proper care of their progeny. A study by a Swedish team (Ali & Lindström, 2005) showed that in comparison to normal-weight women the overweight/obese ones were more likely to be unemployed, poorly educated, to engage in less social participation, to experience little social, emotional or instrumental support, to smoke, to have a sedentary lifestyle, to self-report worse well-being, and to lack an internal locus of control. Not only does it prove the importance of lifestyle for obesity, but it also indicates the relationship of obesity with intramental and interpersonal factors.

The consequences of obesity include stigma, discrimination, and mental health problems. Among the problems related to mental health and life quality Sarwer and Polonsky (2016) list depression, anxiety and anxiety-related disorders (e.g. social phobia). The obese also suffer from lowered self-esteem and self-worth; they are dissatisfied with their own bodies. With regard to food, they lack the sense of control, which – together with the inaccessibility of some areas of functioning – translates into an enormous decrease in the quality of life. The severely obese often report having been sexually abused and maltreated in childhood, the prevalence of victimisation in their group being higher than in the general population.

In some cases, the loss of weight leads to improvement in the psychosocial condition and life functioning of the obese. Positive changes in mental health, which are related to weight loss, are often the most robust in individuals who have lost a significant part of their body mass, as often happens after bariatric

surgery. Unfortunately, even then some relapse into psychopathological symptoms or experience new psychosocial challenges. Those who regain weight are exposed to the recurrence of undesirable mental symptoms, irrespective of the methods of losing weight.

At present, bariatric surgery is the only obesity therapy whose effectiveness has been scientifically confirmed (Budzyński et al., 2017; Major et al., 2020; Szeliga et al., 2020). Gone are the times when it served merely as a method of reducing unwanted body mass – what is more important now are the metabolic effects that lead to resolving obesity complications. Morbid obesity (class III), with BMI over 40 kg/m<sup>2</sup>, meets the criteria to qualify for the procedure. Individuals with BMI exceeding 35 kg/m<sup>2</sup> may qualify if they also suffer from related comorbid conditions, including type 2 diabetes, hypertension, hypercholesterolemia, or sleep apnoea.

The results obtained from 16 out of 28 facilities providing bariatric treatments in Poland showed that in 2014 there were 1,499 such procedures, and that 96.4% of them were performed laparoscopically. However, in 2018 the number of bariatric treatments financed by the Polish National Health Fund grew to 3,718, which was over 500 procedures more than in 2017 (Tarnowski & Jaworski, 2018).

There are two most common types of bariatric surgery. One is sleeve gastrectomy (SG), a procedure to decrease the volume of the stomach to about 30% of its original size. As a result, the amount of food that can be ingested decreases, and the sense of satiety is achieved with less food. The other technique is Roux-en-Y gastric bypass (RYGB), in which the stomach is divided into two parts – a smaller gastric pouch joined with a loop of the small bowel, and a larger secretory part that does not receive any food and thus does not take part in absorbing it, which in turn reduces hunger and normalises metabolic processes.

The procedures are performed using minimally invasive techniques (laparoscopy), which shortens the recovery period. The effectiveness depends on patients' post-operative change of lifestyle because continuing to overeat can still increase body weight. Unfortunately, even those who lose weight soon after the surgery still face the threat of sarcopenia, that is the adverse changes in body composition characterised by the loss of not only fat, but also of skeletal muscles (Pekař et al., 2020). The risk of sarcopenia is further increased by low physical activity. Long-term monitoring of patients' health and multidisciplinary care in dedicated bariatric centres have become a worldwide standard. The key elements are the supervision by a specialised multidisciplinary team (a dietitian, a psychologist, a surgeon), modification of dietary habits, as well as maintaining an increased level of physical activity.

## PSYCHOLOGICAL TEMPORAL VARIABLES AND OBESITY

Kinga Tucholska,  
Bożena Gulla,  
Anna Grabowska,  
Piotr Major

When making lifestyle decisions people rely on various factors, the most fundamental, according to Zimbardo and Boyd (1999), being the time perspective (TP), also called the temporal/time orientation, which in many cases is assumed unknowingly. As described by the time theory by Zimbardo and Boyd (2009) and their concept of time perspective, the ways one perceives temporal dimension and evaluates the past, the present, and the future influence one's life views and the choices that one makes. That, in turn, may strongly affect well-being and health. Individuals who make resolutions while mostly limiting themselves to pondering the current circumstances are oriented towards the present. Others, making decisions in the very same conditions, search for memories of similar situations from the past. They recollect what they did, what the consequences were, and that knowledge constitutes a reference point on how they should act in the present. Such individuals are past-oriented. There is also a third type of people, who, when making decisions, consider their expectations of what may happen, and what costs and benefits may be involved. They are characterised by their orientation towards the future. Paradoxically, although our attitude to time has a tremendous effect on our lives, hardly ever are we aware of the importance of the subjective temporal perspective. Time and the attitude towards it constitute a hidden dimension of all human activities, and a relatively stable tendency to prefer some temporal dimensions to others defines our individual temporal profiles (Zimbardo & Boyd, 2009; Zimbardo et al., 2012).

Zimbardo and Boyd (1999) distinguished the following five fundamental time perspectives: (1) past positive, a perspective related to positive evaluation of the past that constitutes the source of identity and the knowledge about oneself and about the world; (2) past negative, which is dominated by a negative view of the past, filled with regret, harm, disappointment, guilt, or failure; (3) present hedonistic, in which one focuses on pleasant and rewarding aspects of a given situation, lives the moment, does not ponder the consequences, and is actively seeking pleasures and attempting to escape pain or discomfort; (4) present fatalistic – individuals characterised by this perspective focus on the present moment, experiencing it as unpleasant, overwhelming and impossible to change, feeling as if being sentenced to it (by fate, destiny, a higher power); (5) future perspective concentrates on goals, achieving one's own aspirations, foreseeing possible consequences of the situation at hand and choices made.

The future perspective is related to hope and future anxiety. As proposed by Snyder (1994), hope is a learnt pattern of thought that expresses itself in ex-

pecting positive effects of future actions based on the belief that one is equipped with strong will and the ability to successfully face the challenges that may occur along the way to one's goal (pathway thinking). Strong will is a motivating factor, one that allows one to think about oneself as being capable of executing one's plan. It is particularly important in the face of environmental obstacles or fatigue (Łaguna et al., 2005). At the same time, the ability to find solutions is understood as the belief that one has knowledge, abilities, and competences that may contribute to achieving one's goal. Perceiving oneself as being capable and resourceful results in a feeling that, based on one's own thoughts and instructions from others, one is able to achieve the goal in more than one way. A body of research points to the relationship of hope defined in this way with self-efficacy, meaningful life, or satisfaction with one's life (Snyder, 1994).

The future may be looked forward to, or, conversely, seen as a reservoir of worries, concerns, and anxiety. Future anxiety, as described by Zaleski (1996, 2018), is the experience of precariousness, tension, and anxiety related to potentially unfavourable events to come. Worries may pertain to the anticipation of various scenarios, such as loss of a job or health (including by loved ones), the occurrence of a natural disaster, or a global crisis. The intensity of future anxiety depends on such factors as subjective importance of the anticipated event, estimated probability of its occurrence, and self-efficacy. The last of the above-mentioned factors acts as a safeguard in the sense that even if individuals anticipate maleficent events, they feel they will be able to deal with them.

Future anxiety is capable of influencing cognitive processes, attitudes and behaviours. Especially when it reaches considerably high levels, it may result in passivity, novelty avoidance, abandoning activities associated with uncertain outcomes, and a decrease in future planning (Zaleski, 1996). According to Zaleski et al. (2019), future anxiety is correlated with negative evaluation of one's own past, and with a fatalistic view of the present. Despite its strongly pejorative connotations, it is also related to the future time perspective. This finding is thought to stem from the fact that a certain level of such anxiety combined with the right individual qualities may motivate and constructively affect an individual, by prompting setting goals and working on achieving them. Although the relationships between future anxiety and proactivity have yet to be determined, it seems their forms may vary. Taking action may provide a buffering effect against future anxiety, or – in some instances – it may be completely inhibited by the anxiety. Regardless of its type, time perspective (treated as a relatively stable disposition) may be situationally modulated, as can the focus on the past, the present, or the future be stimulated in connection with the emotions of hope and anxiety.

The results of research on the specifics of the configuration of time perspectives in the obese, as understood by Zimbardo and Boyd, are inconclusive. Griva et al. (2014) found that the past negative and present fatalistic perspectives are related to elevated BMI. They also discovered a relationship between present hedonistic perspective and reduced BMI (the results held even when controlled for sociodemographic data). No such results were obtained, however, in a study by Guthrie et al. (2009). Their multivariable models showed no relationships of obesity with measures of future or present hedonistic perspectives, or education; at the same time, models excluding education showed that higher present fatalistic perspective was related to obesity.

An important element of future time perspective is the extent to which individuals are inclined to take into account the consequences of their future actions (consideration of future consequences, CFC; Strathman et al., 1994). Those who focus mainly on the future tend to choose larger rewards, even if considerably delayed, over the smaller but immediate ones (they are characterised by the ability to delay gratification). Individuals orientated towards the present are motivated predominantly by rewards that are closer in time, even if they are smaller. A significant relationship of BMI with orientation towards the present and consumption of unhealthy foods was found (Van Beek et al., 2013). The propensity to take possible consequences of present actions and decisions into account, and to delay reward, is negatively correlated with smoking frequency and with the BMI (Adams, 2012; Adams & Nettle, 2009; Adams & White, 2009). In a series of experiments Chang et al. (2020) found that focusing on the future can reduce the drive to consume unhealthy foods in individuals with a propensity to such behaviours (i.e., in the obese who fail to observe dietary guidelines, and in those who do not tend to ponder the consequences of their actions). When they thought about their future the members of the elevated-BMI group consumed unhealthy food significantly less frequently than when they were provoked to focus on the present. The effect was observed neither in the lower-BMI group nor in those who showed higher consideration of future consequences; it held, however, in both groups regardless of the level of impulsivity.

It is thought that the future orientation is linked to dietary habits and lifestyle indirectly, by the means of other variables. One of the factors that influence the consumption of large amounts of unhealthy food is low socioeconomic status (Inglis et al., 2005), which is also connected to a shorter span of future time perspective (Adams & White, 2009).

Some studies have investigated the relationship of hope with health and the propensity to (un)healthy behaviours, including nutrition and physical activity. Kelsey et al. (2011) found that higher level of hope

(general marker) correlated negatively with the BMI in women. Additionally, the women who reported satisfaction with their health scored significantly higher on state hope. A similar tendency was observed by Northwehr et al. (2013) for trait hope (total score), and for agency (determination in achieving goals) and pathway (know-how) markers; the higher was the BMI, the lower were the scores on these scales. The connection between hope and the BMI-indicated over- or underweight was also studied by Scioli et al. (2016), who discovered a negative relationship between mastery-related hope and abnormal body weight.

Summarising the above, both the theory and the empirical research show that obesity is linked with psychological time, which can be observed in a particular configuration of temporal variables in the overweight and the obese. The research results, however, are far from conclusive, and no research has been conducted on a Polish sample. Given these variables' contribution to psychological mechanisms facilitating obesity, it seems only reasonable to further advance the research in this area.

The aim of the study is to analyse the configuration of temporal variables in the obese. Because, apart from the above-mentioned studies, there is little research on the subject, and none focusing on the Polish population, the problem is a niche area. For this reason, the research questions, mirroring the exploratory nature of the study, are general and pertain to the dominant time perspective, and the levels of future anxiety and hope for success in the obese determined to seek bariatric treatment. The authors believe that discovering and describing the specificity of temporal functioning in the obese will make it possible to enhance the post-operative psychological interventions for the group with established therapeutic techniques focusing on experiencing the psychological time.

## PARTICIPANTS AND PROCEDURE

### PARTICIPANTS

The participants comprised 28 individuals (60.7% women) awaiting bariatric surgery in the 2<sup>nd</sup> Department of General Surgery of the Jagiellonian University Medical College in Krakow. All the patients awaiting the surgery in that facility between January and July 2020 were invited to participate in the study. Only the said 28 agreed to do so. The SARS-CoV-2 pandemic thwarted any attempts to increase number of participants, as bariatric procedures in the hospital were suspended for several months.

The mean age was  $M = 43.82$  years with  $SD = 10.01$  (min = 27, max = 66). With regard to education, the participants comprised the following four groups:

higher education (46%), secondary education (36%), vocational education (14%), and primary education (4%). Asked about their marital status, 54% of the participants reported that they were married, 18% divorced, 18% single, and 3.5% reported that they were in an informal relationship; two individuals provided no information on the subject. The mean BMI was 44.83 kg/m<sup>2</sup> (*SD* = 6.51, min = 32, max = 69). Three participants were qualified for the RYGB procedure while 25 were intended for SG.

The questionnaire part of the study was conducted within one session, after initial supportive conversation with a psychologist (offered to patients in the pre-operative period), a day prior to the surgery. The participants were informed about the aim of the study, about the ways of processing their personal information, and that the data were collected solely for the purpose of scientific research. Informed consent was obtained in writing before the study commenced. The course of the study was monitored by the clinic's psychologist.

The procedures followed were in accordance with the Helsinki Declaration of 1975, as revised in 2000, and with the ethical standards. The study was approved by the Research Ethics Committee at the Institute of Applied Psychology of the Jagiellonian University on November 27, 2020.

## MEASURES

*The Zimbardo Time Perspective Inventory* (ZTPI; Zimbardo & Boyd, 1999) was used to measure five dimensions of TP. It is a self-descriptive questionnaire that consists of 56 items. On a 5-point Likert-type scale participants indicate to what extent a statement applies to them – from 1 (*very untrue*) to 5 (*very true*). The ZTPI consists of five factors: (1) past negative (PN; in Polish translation  $\alpha = .83$ ), a generally aversive view of the past; (2) present hedonistic (PH;  $\alpha = .81$ ), reflects an enjoyment and pleasure centred, risk-taking attitude towards time and life; (3) present fatalistic (PF;  $\alpha = .72$ ), which is living with a belief that life is determined by fate; (4) the future (F;  $\alpha = .76$ ) scale measures a general future orientation, planning for and achievement of future goals often at the expense of present enjoyment, delaying gratification, and avoiding time-wasting temptations; (5) past positive (PP;  $\alpha = .61$ ) reflects a warm, sentimental, positive attitude toward the past, focusing on family, traditions, continuity of self over time. In our study, we used the Polish adaptation of the questionnaire by Przepiórka and authorised by Zimbardo (Sobol-Kwapinska et al., 2016).

*The Dark Future Scale* (DF; Zaleski et al., 2019) is a short, 10-item version of the Future Anxiety Scale. On a 6-point Likert-type scale participants indicate to what extent a statement applies to them – 0 (*de-*

*ecidedly false*), 1 (*false*), 2 (*somewhat false*), 3 (*hard to say*), 4 (*somewhat true*), 5 (*true*), 6 (*decidedly true*). It measures the tendency to think about the future with anxiety, uncertainty, and anticipation of disasters. The higher the score, the stronger is the future anxiety. Cronbach's  $\alpha$  equal to .88 confirms the high internal validity of the instrument.

*The Hope for Success Questionnaire* (HSQ) by Łaguna et al. (2005) is the Polish adaptation of Snyder's Adult Hope Scale (Snyder et al., 1991). It measures hope for success defined as the expectation of a positive outcome of one's actions. It consists of two components: (1) belief in having a strong will, that is being aware of one's agency expressed in goal striving, perseverance, and (2) belief in one's ability to find solutions based on one's knowledge and mental abilities expressed in situations requiring creative problem-solving. The questionnaire consists of 12 statements whose applicability is rated by the subjects on a scale from 1 (*definitely untrue*) to 8 (*definitely true*), but only 8 statements have diagnostic value. Cronbach's  $\alpha$  equal to .82 confirms the high internal validity of the Polish version of the instrument.

## RESULTS

The data obtained by means of each questionnaire are presented in Table 1. Subsequently, comparisons with the data obtained during a validation study on best available match groups of Poles are made, and interpretations are provided. The significance level (*p*-value) for mean differences between the group of bariatric patients (*N* = 28) and the reference groups was determined by the one-sample *t*-test.

With reference to the data gathered by Zimbardo et al. (2012) the bariatric patients' scores proved average with respect to past (both negative and positive), present fatalistic, and future time perspectives. However, in the case of the present hedonistic perspective, their results reached very high levels, indicating firm domination of that perspective, which may be linked to a lifestyle lacking in control or limitations, and which may favour dietary indulgence. The results obtained were compared with the data from a sample (*N* = 464) of middle-aged adult Poles (Sobol-Kwapinska et al., 2016). The significance levels for the differences (see Table 2) show the distinctiveness of time perspective in the obese. Compared to the control group, the obese seem to be much more focused on the present construed in hedonistic categories, and much less on the present understood in fatalistic terms, on the negatively viewed past, or on the future.

The level of future anxiety in the obese prepared for bariatric surgery is significantly lower compared to the data gathered from the sample of the Polish population by Zaleski et al. (2019). Hope total score

**Table 1***Descriptive statistics for the studied variables in the bariatric patient group (N = 28)*

Variable	Items	Possible range	Min	Max	M	SD
Past negative (ZTPI)	10	1-5	1.80	3.80	2.74	0.63
Present hedonistic (ZTPI)	15	1-5	3.60	6.20	4.95	0.62
Future (ZTPI)	13	1-5	1.69	4.15	3.54	0.53
Past positive (ZTPI)	9	1-5	2.22	4.78	3.52	0.58
Present fatalistic (ZTPI)	9	1-5	1.22	3.33	2.34	0.51
Future anxiety (DF)	5	0-30	2	22	13.21	5.67
Hope total score (HSQ)	8	8-63	32	64	49.36	7.80
Agency (HSQ)	4	4-32	15	32	23.57	4.55
Pathway (HSQ)	4	4-32	17	32	25.79	4.24

*TP in bariatric patients**Note.* ZTPI – the Zimbardo Time Perspective Inventory, DF – the Dark Future Scale, HSQ – the Hope for Success Questionnaire.**Table 2***Comparison of the significance levels of differences between the group means (N = 28) and the reference group means*

Variable	Bariatric patients (N = 28)		Reference group		p
	M	SD	M	SD	
Past negative (ZTPI)	2.74	0.63	3.16	0.73	.003
Present hedonistic (ZTPI)	4.95	0.62	3.29	0.49	.001
Future (ZTPI)	3.54	0.53	3.74	0.46	.026
Past positive (ZTPI)	3.52	0.58	3.57	0.52	.595
Present fatalistic (ZTPI)	2.34	0.51	2.91	0.69	.001
Future anxiety (DF)	13.21	5.67	23.80	5.83	.001
Hope total score (HSQ)	49.36	7.80	47.67	7.86	.263
Agency (HSQ)	23.57	4.55	22.33	4.62	.161
Pathway (HSQ)	25.79	4.24	25.32	4.19	.562

*Note.* ZTPI – the Zimbardo Time Perspective Inventory, DF – the Dark Future Scale, HSQ – the Hope for Success Questionnaire. Reference group data for ZTPI source: Sobol-Kwapińska et al., 2016; DF: Zaleski et al., 2019; HSQ: Łaguna et al., 2005.

and the specific markers for agency and pathway in the bariatric group fall within the average range when compared to the Polish norms derived from a study on 621 young men and women (Łaguna et al., 2005).

Additionally, an attempt was made to analyse the mutual relationships of the temporal variables in the bariatric group. To that end, Spearman's rank correlation coefficient values were calculated.

A handful of significant relationships were observed. Stronger belief in one's strong will was found to be related to a stronger focus on the positive past and weaker focus on the negative past, and to lower

future anxiety. The stronger the belief in one's capability of finding solutions, the stronger was the focus on the hedonistic present (it seems reasonable to infer that this is a false/maladaptive belief because these solutions seem to boil down to eating, which generates further problems). Similarly, the higher the hope for success, the stronger was the focus on the hedonistic present (again, it stands to reason that it is a false hope because focusing on pleasures and food generates further problems). Elevated future anxiety was related to a stronger focus on the negative past, and to a weaker focus on the positive past.

**Table 3**

*Spearman's rank correlation coefficient values for time perspectives, future anxiety, and hope for success in bariatric patients (N = 28)*

Variable	PN	PH	F	PP	PF	FA	H	A	P
PN	–								
PH	.05	–							
F	.24	.15	–						
PP	.09	.40*	.43*	–					
PF	.18	.25	–.01	.25	–				
FA	.51*	–.10	.25	–.40*	.01	–			
H	–.26	.42*	.03	.34	.01	–.24	–		
A	–.45*	.32	.02	.40*	.02	–.45*	.87*	–	
P	–.02	.49*	.02	.24	.06	–.03	.85*	.52*	–

*Note.* PN – past negative, PH – present hedonistic, F – future, PP – past positive, PF – present fatalistic, FA – future anxiety, H – hope total score, A – agency, P – pathway; \* $p < .05$ .

## DISCUSSION

The results obtained on time perspective in the bariatric patients oppose the findings of Griva et al. (2014), and align to some extent – that is with regard to the connection between obesity and present hedonistic perspective – with the results provided by Guthrie et al. (2009). It is possible that a particular configuration of time perspectives in the obese is determined by situational context; this study was conducted just prior to a bariatric surgery procedure.

On the one hand, the specificity of given situation can modulate time perspective to some extent, and facilitate shifting to task orientation with regard to future purposes (undergoing the procedure, recovering from it, changing diet, and engaging in more physical activity); on the other hand, confronted with such strong present hedonism, the execution of those plans is at serious risk. Such a high score in the present hedonistic scale and low in the future anxiety scale may also indicate defensive mechanisms at work (allowing the focus to drift away from the negative aspects of a situation), as well as an unrealistic, even wishful, view of the future. Another possibility is that the existing mechanisms of coping with tension by eating (including tension related to negative experiences from the past, fatalistic aspects of the present, and the challenging, anxiety-inducing future) were successful in relieving it.

The participants' hope levels were not significantly different from the average. Nonetheless, having considered the fact that, according to their recollections, they unsuccessfully struggled against obesity on many an occasion, it would be reasonable to expect that their levels of hope for success would be

lower than those of the general population. However, because the results conform to the norm, it may be reasoned that such results in people who struggle to cope with obesity and unhealthy eating habits may stem from: (a) effective functioning in other areas of life (despite the difficulties caused by obesity); (b) the specificity of the psychological situation in the pre-surgery period (the procedure is thought to be a solution to obesity, while in fact it is only the beginning of the journey to normal weight and a normal figure); (c) the functioning of psychological mechanisms that are typical for addictions (self-deception, belief that one is able to regain the control of eating behaviours if one wants, belief that one can successfully solve the problem). Further support for that notion can be found in the levels of future anxiety, which also seem to fall within the middle range (meaning that an unfavourable course of future events is not assumed, such as, for example, regaining weight despite the surgery).

## LIMITATIONS

The study was conducted on a relatively small sample, which only allows one to generalise the conclusions with caution. Another limitation of the study was imposed by the necessity for the researchers to adjust to the dynamics of the preparations for the bariatric procedure, which forced the study to take place a day prior to the planned surgery, which, in turn, could have influenced the results obtained, the pre-operative stress levels being a confounding variable. In future studies the participants should be recruited from patients at earlier stages of contact with the clinic (e.g. at the time of the appointment qualify-

ing them for the procedure), and they should be monitored for a longer period for any fluctuations in their temporal dispositions after the surgery. It would also be prudent to compare the group subjected to intervention focusing on temporal variables with a group not subjected to this type of intervention, and to verify their usefulness in meeting the target body mass after bariatric treatments.

## CONCLUSIONS

The results obtained demonstrate the pertinence of psychological temporal variables in obesity and its progression. The specificity of functioning of the obese, which is related to strong focus on the present construed in the categories of hedonism, can be modified by the time perspective therapy (Zimbardo et al., 2012) striving for a more balanced time perspective. It is this goal that the post-operative psychological interventions supplementing surgical treatments, psychoeducation and emotional support should serve. The path to that change leads through mindfulness training – the important ability to accurately identify bodily cues of hunger and satiety – and through the awareness of emotional determinants leading to overeating, and development of a range of countermeasures that would make it possible to cope with tension and anxiety without resorting to comforting with food. Connecting the hope for success with a realistic, not defensive, view of one's situation and personal means of control can both prevent the growth of the problem of obesity and facilitate success after bariatric surgery. Research shows that some elements of hope therapy or hope training (Snyder, 1994), and time perspective therapy – specialist interventions based on a cognitive-behavioural approach – could increase the effectiveness of obesity treatment and prevent its relapse. It is reasonable to expect that interventions focusing on how psychological time is experienced may significantly enrich what professionals have to offer not only to post-bariatric patients but also to those who require assistance only in modifying their lifestyle.

Apart from surgical treatment, the entirety of obesity treatment usually includes psychoeducation in the broad sense, dietary education, as well as keeping supportive company before and after the surgery. The above-mentioned elements of temporal therapy are worth including in the canon of psychological interventions, as are such techniques typically applied in addiction therapy for disabling mechanisms that contribute to overeating (the mechanisms of habitual or addictive regulation of emotional states with food, the mechanisms of illusion and denial, and the mechanisms of splitting and diffusion of Self; cf. Mellibruda, 1997). The effort to integrate the sense of identity, to include one's bodiliness in the image of the Self, to

develop care for one's body, to strengthen self-care functions, together with enhancing the strategies of coping and of self-regulation of emotional excitation, will make it possible to achieve lasting treatment effects and maintain stable weight within normal parameters.

## REFERENCES

- Aamodt, S. (2016). *Dlaczego tyjemy od diet. Niezamierzone konsekwencje naszej obsesji na punkcie odchudzania* [Why we gain weight from diets. The unintended consequences of our obsession with losing weight]. Wydawnictwo Zysk i S-ka.
- Adams, J. (2012). Consideration of immediate and future consequences, smoking status, and body mass index. *Health Psychology, 31*, 260–263. <https://doi.org/10.1037/a0025790>
- Adams, J., & Nettle, D. (2009). Time perspective, personality and smoking, body mass, and physical activity: an empirical study. *British Journal of Health Psychology, 14*, 83–105. <https://doi.org/10.1348/135910708X299664>
- Adams, J., & White, M. (2009). Time perspective in socioeconomic inequalities in smoking and body mass index. *Health Psychology, 28*, 83–90. <https://doi.org/10.1037/0278-6133.28.1.83>
- Ali, S. M., & Lindström, M. (2005). Socioeconomic, psychosocial, behavioural, and psychological determinants of BMI among young women: differing patterns for underweight and overweight/obesity. *European Journal of Public Health, 16*, 325–331. <https://doi.org/10.1093/eurpub/cki187>
- Artemniak-Wojtowicz, D., Kucharska, A. M., & Pyrzak, B. (2020). Obesity and chronic inflammation crosslinking. *Central European Journal of Immunology, 45*, 461–468. <https://doi.org/10.5114/ceji.2020.103418>
- Brończyk-Puzoń, A., Nowak, J., Dittfeld, A., & Bieńiek, J. (2014). Epidemiologia otyłości na świecie i w Polsce [Epidemiology of obesity in the world and in Poland]. *Forum Zaburzeń Metabolicznych, 5*, 1–5.
- Budzyński, A., Major, P., Głuszek, S., Kaseja, K., Koszutski, T., Leśniak, S., Lewandowski, T., Lipka, M., Lisik, W., Makarewicz, W., Michalik, M., Myśliwiec, P., Ostrowska, L., Orłowski, M., Paluszkiwicz, R., Pastuszka, M., Paśnik, K., Pędziwiatr, M., Proczko-Stepaniak, M., ... Wyleźoń, M. (2017). Polish recommendations in the field of bariatric and metabolic surgery. *Medycyna Praktyczna dla Lekarzy*. Retrieved from <https://www.mp.pl/chirurgia/wytyczne-przegladowe/154894,polskie-rekomendacje-w-zakresie-chirurgii-bariatrycznej-i-metabolicznej>
- Chang, B. P. I., Classeen, M. A., & Klein, O. (2020). The time is ripe: Thinking about the future reduces un-

TP in bariatric patients

- healthy eating in those with a higher BMI. *Foods*, 9, E1391. <https://doi.org/10.3390/foods9101391>
- Donofry, S. D., Stillman, C. M., & Erickson, K. I. (2019). A review of the relationship between eating behavior, obesity and functional brain network organization. *Social Cognitive and Affective Neuroscience*, 15, 1–25. <https://doi.org/10.1093/scan/nsz085>
- Ellulu, M. S., Patimah, I., Khaza'ai, H., Rahmat, A., & Abed, Y. (2017). Obesity and inflammation: The linking mechanism and the complications. *Archives of Medical Sciences*, 13, 851–863. <https://doi.org/10.5114/aoms.2016.58928>
- Griva, F., Tseferidi, S. I., & Anagnostopoulos, F. (2014). Time to get healthy: Associations of time perspective with perceived health status and health behaviors. *Psychology, Health & Medicine*, 20, 25–33. <https://doi.org/10.1080/13548506.2014.913798>
- Guthrie, L. C., Butler, S. C., & Ward, M. M. (2009). Time perspective and socioeconomic status: a link to socioeconomic disparities in health? *Social Science & Medicine*, 68, 2145–2151. <https://doi.org/10.1016/j.socscimed.2009.04.004>
- Hruby, A., Manson, J. E., Qi L., Malik, V. S., Rimm, E. B., Sun, Q., Willett, W. C., & Hu, F. B. (2016). Determinants and consequences of obesity. *American Journal of Public Health*, 106, 1656–1665. <https://doi.org/10.2105/AJPH.2016.303326>
- Inglis, V., Ball, K., & Crawford, D. (2005). Why do women of low socioeconomic status have poorer dietary behaviours than women of higher socioeconomic status? A qualitative exploration. *Appetite*, 45, 334–343. <https://doi.org/10.1016/j.appet.2005.05.003>
- Kelsey, K. S., DeVellis, B. M., Gizlice, Z., Ries, A., Barnes, K., & Campbell, M. K. (2011). Obesity, hope, and health: Findings from the HOPE Works Community Survey. *Journal of Community Health*, 36, 919–924. <https://doi.org/10.1007/s10900-011-9390-6>
- Łaguna, M., Trzebiński, J., & Zięba, M. (2005). *Kwestionariusz Nadziei na Sukces. Podręcznik* [The Hope for Success Questionnaire. Manual]. Pracownia Testów Psychologicznych Polskiego Towarzystwa Psychologicznego.
- Major, P., Stefura, T., Dziurawicz, B., Radwan, J., Wysocki, M., Małczak, P., & Pędziwiatr, M. (2020). Quality of life 10 years after bariatric surgery. *Obesity Surgery*, 30, 3675–3684. <https://doi.org/10.1007/s11695-020-04726-7>
- Mellibruda, J. (1997). Psycho-bio-społeczna koncepcja uzależnienia od alkoholu [Psycho-bio-social concept of alcohol addiction]. *Alkoholizm i Narkomania*, 3, 277–306.
- Northwehr, F., Clark, D. O., & Perkins, A. (2013). Hope and the use of behavioural strategies related to diet and physical activity. *Journal of Human Nutrition and Dietetics*, 26, 159–163. <https://doi.org/10.1111/jhn.12057>
- Pekař, M., Pekařova, A., Buřga, M., Holéczy, P., & Soltes, M. (2020). The risk of sarcopenia 24 months after bariatric surgery – assessment by dual energy X-ray absorptiometry (DEXA): a prospective study. *Videosurgery and Other Miniinvasive Techniques*, 15, 583–587. <https://doi.org/10.5114/wiitm.2020.93463>
- Rebello, C. J., Kirwan, J. P., & Greenway, F. L. (2020). Obesity, the most common comorbidity in SARS-CoV-2: Is leptin the link? *International Journal of Obesity*, 44, 1810–1817. <https://doi.org/10.1038/s41366-020-0640-5>
- Sarwer, D. B., & Polonsky, H. M. (2016). The psychosocial burden of obesity. *Endocrinology and Metabolism Clinics of North America*, 45, 677–688. <https://doi.org/10.1016/j.ecl.2016.04.016>
- Scioli, A., Scioli-Salter, E. R., Sykes, K., Anderson C., & Fedele, M. (2016). The positive contributions of hope to maintaining and restoring health: an integrative, mixed method approach. *Journal of Positive Psychology*, 11, 135–148. <https://doi.org/10.1080/17439760.2015.1037858>
- Snyder, C. R. (1994). *The psychology of hope*. Free Press.
- Snyder, C. R., Simpson, S. C., Ybasco, F. C., Borders, T. F., Babyak, M. A., & Higgins, R. L. (1991). Development and validation of the State Hope Scale. *Journal of Personality and Social Psychology*, 70, 321–335. <https://doi.org/10.1037/0022-3514.70.2.321>
- Sobol-Kwapińska, M., Przepiórka, A., & Zimbaro, P. G. (2016). The structure of time perspective: Age-related differences in Poland. *Time & Society*, 28, 5–32. <https://doi.org/10.1177/0961463X16656851>
- Spence, C. (2018). *Gastrofizyka. Nowa wiedza o jedzeniu* [Gastrophysics. New knowledge about food]. Wydawnictwo Świat Książki.
- Strathman, A., Gleicher, F., Boninger, D. S., & Edwards, C. S. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology*, 66, 742–752. <https://doi.org/10.1037/0022-3514.66.4.742>
- Szeliga, J., Wyleżół, M., Major, P., Budzyński, A., Binda, A., Proczko-Stepaniak, M., Boniecka, I., Małłok, M., Sekuła, M., Kaska, Ł., Myśliwiec, P., Szewczyk, T., Możański, M., Kowalski, G., Pesta, W., Lisik, W., Michalik, M., Lewandowski, T., & Paśnik, K. (2020). Metabolic and Bariatric Surgery Chapter of the Association of Polish Surgeons. Bariatric and metabolic surgery care standards. *Videosurgery and Other Miniinvasive Techniques*, 15, 391–394. <https://doi.org/10.5114/wiitm.2020.97935>
- Tarnowski, W., & Jaworski, P. (2018). Operacje bariatryczne w praktyce [Bariatric operations in clinical practice]. *Gastroenterologia Kliniczna*, 10, 93–101.
- Van Beek, J., Antonides, G., & Handgraaf, M. J. (2013). Eat now, exercise later: The relation between consideration of immediate and future consequences and healthy behavior. *Personality and Individual*

- Differences*, 54, 785–791. <https://doi.org/10.1016/j.paid.2012.12.015>
- Zaleski, Z. (1996). Future anxiety: Concept, measurement, and preliminary research. *Personality and Individual Differences*, 21, 165–174. [https://doi.org/10.1016/0191-8869\(96\)00070-0](https://doi.org/10.1016/0191-8869(96)00070-0)
- Zaleski, Z. (2018). *Psychologia lęku przed przyszłością* [Psychology of future anxiety]. Difin.
- Zaleski, Z., Sobol-Kwapinska, M., Przepiorka, A., & Meisner, M. (2019). Development and validation of the Dark Future Scale. *Time & Society*, 28, 107–123. <https://doi.org/10.1177/0961463X16678257>
- Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: a valid, reliable individual-differences metric. *Journal of Personality and Social Psychology*, 77, 1271–1288. <https://doi.org/10.1037/0022-3514.77.6.1271>
- Zimbardo, P. G., & Boyd, J. N. (2009). *The time paradox*. Simon & Schuster.
- Zimbardo, P. G., Sword, R., & Sword, R. (2012). *Time cure: Overcoming PTSD with the new psychology of time perspective therapy*. Jossey-Bass.

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