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THESES OF THE DOCTORAL DISSERTATION

Edit Czeglédi

PSYCHOLOGICAL CORRELATES AND INTERVENTIONAL POSSIBILITIES OF OBESITY IN ADULTHOOD

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Introduction¹

Obesity² is a complex disorder with multifactorial etiology and severe health consequences, often putting heavy loads both on the individuals and the society (Hu, 2008). Sixty percent of the adult, and 20% of the adolescent population in Hungary is being overweight or obese (KSH, 2010; Németh, 2011). The increased calorie-intake and the sedentary lifestyle (Afridi & Khan, 2004) in the modern so-called „toxic” environment – that predisposes obesity (Brownell, 2005) – partially explain the increasing prevalence of obesity. Some eating behaviours (for instance, emotional eating, which is described as an emotion-focused coping strategy), are identified as obesogenic factors (responsible for obesity) in the literature (de Lauzon et al., 2004). According to the well-studied and often-debated restraint theory, lowering or restricting calorie intake in order to control body weight and shape may lead to episodic overeating, which causes overweight or even obesity (Herman & Polivy, 1975).

Professional weight loss interventions (except surgical treatment) result only in modest weight loss (5-10%; Foster, 2003). Moreover, most of the individuals regain the lost weight (Byrne et al., 2004). However, even the modest weight loss has statistically and clinically significant physical and mental health benefits (Fabricatore, 2007). Despite of the huge amount of professional and popular weight reducing methods and strategies, the prevalence of obesity is high and still shows continuous and dramatic increase (Berghöfer et al., 2008). The examination of the predictors of successful weight loss enhance the optimization of cost-effective strategies in weight loss interventions (Teixeira et al., 2005). The transtheoretical model of behaviour change (Prochaska et al., 1992) proves to be a promising theoretical framework for body weight management interventions.

The ongoing research in the field of psychological correlates of obesity is aimed to identify the risk factors, and also to reveal the direction of the causal relationships between obesity and its correlates (Friedman & Brownell, 1995). The latest model of obesity suggests bi-directional causal relationship between obesity and common mental health disorders, which is mediated and moderated by several factors (Gatineau & Dent, 2011). In spite of the huge amount of measures for obese population, the availability of adapted questionnaires into Hungarian are very limited in the literature (e.g. Czeglédi, 2008).

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² The medical classification of the nutritional state is based on the body mass index (BMI) categories. The WHO (2000) regards a BMI of less than 18.5 as underweight, between 18.5-24.9 as normal weight, between 25.0-29.9 as overweight, and above 30.0 is considered obese. This distinction is important for specifying health risks, but it is less clear whether these BMI cutoffs are meaningful with respect to the social and psychological consequences of excess weight. According to the guidance of Schwartz and Brownell (2004), we used the terms „obesity” and „obese” regardless to the degree of excess weight. The relevance of the use of the medical categories are indicated by providing the BMI values.

Aims

The thesis discusses three studies, with the following main aims:

1. Adapting and providing psychometrically sound instruments for obese population in Hungary.
2. Examination of the risk factors and explanatory variables of some psychological correlates of obesity.
3. Investigation and evaluation of two weight control programs in real circumstances.
4. Examination of the psychological advantages of intentional weight loss.
5. Testing the predictors of successful weight loss.

Research studies

1. Hungarian adaptation of the Three-Factor Eating Questionnaire Revised 21-Items

Introduction of the measure

The Three-Factor Eating Questionnaire Revised 21-Items (TFEQ-R21, Tholin et al., 2005; Czeglédi & Urbán, 2010) is a self-report, Likert-type scale for the operationalization of eating behaviours identified as obesogenic factors. The Uncontrolled Eating Scale (9 items) assesses the tendency to lose control over eating when feeling hungry or when exposed to food-related stimuli. The Cognitive Restraint Scale (6 items) assesses the tendency to control food intake in order to influence body weight and shape. The Emotional Eating Scale (6 items) measures the propensity to overeat in relation to negative mood states, e.g., when feeling lonely, anxious, or depressed.

Main objectives of the study

The main goals of the study were to adapt the TFEQ-R21 into Hungarian language and to explore the potential determinants of eating behaviours.

Study design

Questionnaire-based, cross-sectional study.

Study sample

Study sample consisted of female university students (ELTE PPK; n=262). The mean age was 21.7 years (SD=2.78, range 19-35 years) and the mean body mass index (BMI) was 20.8 kg/m² (SD=2.93 kg/m², range 15.2-36.1 kg/m²). Eight percent of the sample were overweight or obese (BMI≥25.0 kg/m²).

A subgroup of university students studying psychology completed the questionnaire twice, in a two-week period (n=121; the mean age 21.4 years; SD=3.26 years, range 19-34 years; the mean BMI 20.4 kg/m², SD=2.35 kg/m², range 15.6-31.9 kg/m²).

Measures

Sociodemographic and self-reported anthropometric data; TFEQ-R21; Body Attitude Test; Trait-Anxiety Scale.

Results

The confirmatory factor analysis (CFA) supported the factorial structure of questionnaire with slight changes ($\chi^2_{(184)}=422.2$, $p<.0001$, $CMIN/DF=2.294$, $CFI=.917$, $TLI=.896$, $RMSEA=.070$, $RMSEA CI_{90}=.062-.079$). The scales had excellent internal consistencies (Cronbach α : .82-.93) and test-retest reliabilities ($r_s=.79-.91$). Intercorrelations of eating behaviours were different in female university students comparing with overweight people (Karlsson et al., 2000), showing similarity with the general population (de Lauzon et al, 2004).

According to the results of the multiple indicators and multiple causes (MIMIC) analysis, BMI had significant relationship only with emotional eating. Body dissatisfaction predicted higher levels of restrained eating. Higher levels of trait anxiety enhanced the tendency towards uncontrolled eating and emotional eating ($\chi^2_{(241)}=464.7$, $p<.0001$, $CMIN/DF=1.928$, $CFI=.868$, $TLI=.835$, $RMSEA=.084$, $RMSEA CI_{90}: .073-.096$).

Limitations

The main limitations of the present study are the use of convenience sampling and the cross-sectional nature of the study design; therefore, the direction of causal relationship is uncertain. Second, as self-report measures were used in the study, there was no objective measure of anthropometric data. Thus, the BMI scores should be interpreted carefully. Finally, as we examined the population of university students, the generalization of the results is restricted.

Conclusion

The results confirmed the construct validity of the Hungarian version of the Three-Factor Eating Questionnaire Revised 21-Items on the sample of female university students. Some explanatory variables of eating behaviours have been supported.

2. Lessons from a workplace lifestyle changing team competition

Introduction

Workplaces have a great importance in obesity prevention (Yancey et al., 2007). The National Institute for Health Development (OEFI) has evolved a health developing program, the so-called „Together – Easier”. The goal of this workplace lifestyle-changing team competition was to improve fitness and general physical and mental health.

Study design

Prospective, questionnaire-based research. The time interval was six months that contained two data administration.

Sample

Study sample consisted of the participants of the III. „Together – Easier” workplace lifestyle-changing team competition (n=377; 39% men). The mean age was 38.8 years (SD=9.58 years, range 22-60 years). The mean BMI was 27.0 kg/m² (SD=5.52 kg/m², range 18.1-60.6 kg/m²). Sixty-one percent were overweight or obese (BMI≥25.0 kg/m²).

Measures

Sociodemographic data; objective measure of antropometric data; questions relating to body weight and its history; walking test and fitness index; Exercise: Stages of Change (Short Form; Marcus et al., 1992; Czeglédi et al., 2011a); Obesity Beliefs Scale (OBS; Swift et al., 2007); TFEQ-R21; Eating Disorder Inventory Bulimia subscale; questions relating to the frequency of eating different foods and drinks; Body Shape Questionnaire – Short Form (BSQ-SF14; Dowson & Henderson, 2001; Czeglédi et al, 2011b).

Results

The CFA supported the factorial structure of OBS with slight changes ($\chi^2_{(84)}=173.6$, $p<.0001$, CMIN/DF=2.067, CFI=.927, TLI=.908, RMSEA=.053, RMSEA CI₉₀=.042-.064). The internal consistencies of scales were good (Cronbach α : .66-.75). According to the results of the MIMIC analysis, overweight/obese participants and women endorse costs of ideal weight more than participants with normal weight and men. The higher educated participants shared the beliefs of social and aesthetical consequences of obesity more than less educated people (those who finished elementary or high school) ($\chi^2_{(121)}=236.6$, $p<.0001$, CMIN/DF=1.955, CFI=.905, TLI=.866, RMSEA=.050, RMSEA CI₉₀: .041-.060).

The CFA supported the one-factor structure of the BSQ-SF14 with slight changes ($\chi^2_{(75)}=329.1$, $p<.0001$, CMIN/DF=4.387, CFI=.935, TLI=.922, RMSEA=.095, RMSEA CI₉₀=.085-.106). The internal consistency of the questionnaire was excellent (Cronbach α : .95). According to the results of the multiple linear regression analysis, all tested risk factors showed significant association with body dissatisfaction, with the exception of age. Gender (female) proved to be the strongest risk factor. Explanatory variables of body dissatisfaction were the actual body weight, the bulimic tendencies, the number of lifetime yo-yo effects, and the educational level. The analysis by gender groups supported the moderator role of gender in association with the tested risk factors of body dissatisfaction.

The patterns of eating behaviours relating to the preferences of different types of foods met our expectancies; however, the associations were weak ($r_s \leq |.29|$). Most of the significant associations were related to cognitive restraint, which is usually featured by the rare consumption of high caloric foods and the frequently consumption of healthy foods. The tendency towards uncontrolled eating and emotional eating predicted the higher consumption of sweets and snacks.

Cognitive restraint was significantly higher among those individuals, who exercised on a regular basis than those of inactive ones ($F_{(1)}=17.829$, $p<.001$, Cohen $d=.43$) and just as women compared with men ($F_{(1)}=28.635$, $p<.001$, Cohen $d=.55$).

Considering the stages of behaviour change relating to regular physical exercise, one third of the participants were in the maintenance stage in the beginning of the program; namely, they had been doing intensive physical exercise for at least 6 months, minimum three times per week, at least 20 minutes occasionally. Nearly 20% were in the action stage, and another 20% were in the preparation stage. Nearly one fourth of the participants were in the contemplation stage. Only few (<5%) were in the

precontemplation stage (those who were not doing any regular physical exercise at present, and were not planning in the future). Fifty-two percent of the sample were doing regular physical exercise at the baseline, which is a higher rate, comparing with the national representative data of Eurobarometer research in 2009 (23%; $\chi^2_{(1)}=172.8$, $p<.001$).³

The average weight loss of the participants was 2.0 kg (SD=3.94 kg), which was average 2.4% of the body weight measure at the beginning (SD=4.19%). This average weight loss was lower than the workplace team competition results reported by Brownell et al. (1984) (average 4.5 kg, $t_{(376)}=12.140$, $p<.001$, Cohen $d=1.86$). The mean of weight loss was significantly higher in case of overweight/obese participants, than normal body weight individuals (2.8% [SD=4.47%] vs. 1.7% [SD=3.62%], $t_{(375)}=2.602$, $p=.010$, Cohen $d=.28$). According to the criterion of successful weight loss (at least 5% weight loss and/or 10% reducing of body fat; Teixeira et al., 2004), 34.6% of the sample was successful. The frequency of successful weight loss was similar in the two weight groups (normal weight participants 34.7%; overweight or obese respondents 34.8%; $\chi^2_{(1)}=.000$, $p=.986$). Besides weight loss, anthropometric variables (e.g. body fat percentage, waist circumference) also showed significant improvements. Effect sizes of changes were larger in males than in females.

The two measures of fitness indices were compared by genders and nutritional states. Results indicated significant and huge improvement in cardiorespiratory fitness with statistically great effect sizes (Cohen $d=1.70-2.41$).

According to the results of the multivariate binary logistic regression analysis, the successful weight loss occurred with a greater odds in men than in women at tendency level (OR=.59, CI₉₅=.33-1.06, $p=.077$). Moreover, youngsters had significantly greater odds for successful weight loss than older ones (OR=.97, CI₉₅=.93-1.00, $p=.031$).

Limitations

Only one third of those who have participated in the program took part in the study. Another limitation is the selection bias, as those people who took part in the study were mainly males, had higher mean body weight, and had lower mean body fat percentage than those who refused participation in the study. Study participants were not independent from each other. Methodological consideration of the objective measure of the anthropometric data also have to be acknowledged (e.g. non-standard clothes, different measuring equipment). We also have to consider the possibility of results manipulation by the participants in walking test. We did not measure the drop-out rate; therefore, the testing procedure of the predictors of weight loss may be insufficient (Teixeira et al., 2004). Only a few participants could achieve successful weight loss, thus, the statistical power of some analysis is relatively low. Those people with low socioeconomic status were underrepresented in the study. The generalization of the results is limited.

Conclusion

Study results confirmed several explanatory variables of obesity-related beliefs and body dissatisfaction. The research could also prove that the „Together – Easier” workplace lifestyle-changing team competition is a promising initiation for decreasing the epidemic of obesity.

³ http://ec.europa.eu/public_opinion/archives/ebs/ebs_334_fact_hu_en.pdf. Downloaded on February 4, 2012.

3. Lessons from an inpatient weight loss treatment program

Introduction

The number of comprehensive, well-developed inpatient treatment protocols for weight loss group therapies is very limited in Hungary.

Research design

Prospective, questionnaire-based research. The time interval was six months that contained two data collection waves.

Sample

Study sample consisted of patients who participated in the inpatient weight loss treatment program in the Lipidological Department of Szent Imre Hospital – that belongs to the Local Government of the Capital – (n=339, 19% men). The mean age was 50.2 years (SD=13.47 years, range 18-85 years). The mean BMI was 38.6 kg/m² (SD=7.58, range 25.1-79.3 kg/m²). Eighty-nine percent of the participants were obese (BMI≥30.0 kg/m²). One hundred-seventy five participants took part in the follow-up (16% men).

Intervention

We have integrated the inpatient weight loss protocol (very low-calorie diet, education given by dietetic expert, exercise program, medical examination by an internist, and drug therapy if it was needed; Pados et al., 2002) with a one-session group psycho-education based on the behavioural treatment of obesity (Jones & Wadden, 2006).

Measures

Sociodemographic data; self-reported anthropometric data; self-evaluation of health condition; type and numbers of treated illnesses; questions relating to body weight and its history; OBS; TFEQ-R21; BSQ-SF14; Exercise: Stages of Change (Short Form); Goals and Relative Weights Questionnaire (Foster et al., 1997); Obesity Adjustment Survey – Short Form (OAS-SF; Butler et al., 1999); Social Support in Weight Loss Efforts Scale (the questionnaire was developed by the author); Rosenberg Self-esteem Scale; CES-D Depression Scale.

Results

Participants usually have unrealistic expectations for weight loss as their weight goals demanded more weight loss than the non-surgical, professional weight loss treatments are usually capable of.

The CFA did not support the OAS-SF one-factor structure ($\chi^2_{(170)}=538.5$, $p<.0001$, CMIN/DF=3.167, CFI=.841, TLI=.804, RMSEA=.080, RMSEA CI₉₀=.073-.088). However, the alternative seven-factor solution showed acceptable fit to the data ($\chi^2_{(149)}=304.1$, $p<.0001$, CMIN/DF=2.041, CFI=.933, TLI=.906, RMSEA=.055, RMSEA CI₉₀=.047-.064, $\Delta\chi^2=234.4$, $\Delta df=21$, $p<.001$). The internal consistency of the questionnaire was good (Cronbach α : .89).

According to the correlation analyses, all tested risk factors of obesity-related quality of life were supported, with the only exception of age. The results of the multivariate linear regression analysis indicated strong explanatory power for the following variables: the degree of overweight, the negative

subjective evaluation of health condition, body dissatisfaction, beliefs relating to the costs of weight control, beliefs relating to the social and aesthetic consequences of obesity, and depression.

Fifty-five percent of the participants had clinical depression. Moreover, the risk for developing depression in women was two and a half times more than for men (59% vs. 37%; $\chi^2_{(1)}=10.412$, $p=.001$; OR=2.51, OR CI₉₅: 1.42-4.44, $p=.002$). According to the results of the multivariate binary logistic regression analysis, higher body dissatisfaction, lower endorsement of obesity-related health consequences, lower levels of perceived social support relating to weight loss efforts, and lower self-esteem emerged as risk factors of clinical depression.

According to the results of the mediation analyses, body dissatisfaction partially mediated the relationship between obesity and depression (Sobel $z=3.68$, $p<.001$; $R^2=46\%$), and fully mediated the relationship between obesity and low self-esteem (Sobel $z=2.57$, $p<.001$; $R^2=62\%$). Gender had a moderator role in the above-mentioned connections: the explained variance relating to depression was higher for women than for men (50% vs. 35%); while there was no significant association between obesity and self-esteem in women.

A relationship was found between depression and higher tendency towards emotional eating; however, the association was weak (women: $r_s=.21$, $p<.001$; men: $r_s=.21$, $p=.108$).

The follow-up participants ($n=175$) lost on average 4.5 kg (SD=7.11 kg) six months after the inpatient weight loss treatment, which was average 4.3% (SD=6.30%) of the baseline body weight. Forty percent of the respondents ($n=70$) achieved clinically significant (at least 5%), successful weight loss. Nine percent of the participants gained 3% or more weight. Goulis et al. (2004) did not find significant decrease in the mean BMI of obese people during six months long standard hospital care (baseline: mean of BMI 37.8 kg/m² [SD=7.8]; follow-up: mean of BMI 37.2 kg/m² [SD=8.7]; Cohen $d=.16$). However, the results of the present study are much more better, as BMI showed significant decrease with a medium effect size (baseline: mean of BMI 38.4 kg/m² [SD=7.35]; follow-up: mean of BMI 36.6 kg/m² [SD=7.21]; $t_{(174)}=9.534$; $p<.001$; Cohen $d=.57$).

Eighty-three percent of the follow-up respondents participated in the psycho-educational group session. Sixty-nine percent of this subgroup reported the use of some kind of behaviour weight loss strategy they had learnt during the session (average 2.6 strategy [SD=1.59]). The strategy-users lost significantly higher percent of their body weight with medium effect size than strategy non-users (5.5% [SD=6.25%] vs. 2.4% [SD=6.57%]; $t_{(137)}=2.691$, $p=.008$, Cohen $d=.50$). There was a weak, however positive relationship between the numbers of applied strategies and weight loss ($r_s=.19$, $p=.026$).

Eating behaviours also changed in a positive direction. Cognitive restraint increased with a large effect size (Cohen $d=1.48$), while uncontrolled eating and emotional eating decreased with a medium effect size (Cohen $ds=.56$ and $.44$, respectively). These findings correspond with previous research (Foster et al., 1998). According to the reliable change index (Jacobson & Truax, 1991) 9% of the participants in relation to cognitive restraint, 5% in relation to uncontrolled eating, and finally, 8% in relation to emotional eating showed statistically reliable improvement.

Depression and self-esteem did not show significant change on a group level; however, 5% of the participants in relation to depression, and 3% in relation to self-esteem reported statistically reliable improvement. Results of the multivariate hierarchical linear regression analyses indicated a relationship between weight loss and improvements in depression ($\beta=.20$; $p=.006$) and self-esteem ($\beta=.18$, $p=.022$).

Thirty-five percent of the participants reported regular physical exercise at the baseline assessment, which is higher, than the data reported by the Eurobarometer representative research in 2009 (23%, $\chi^2_{(1)}=25.215$, $p<.001$). In relation to stages of behaviour change, one-fifth of the participants were in the maintenance stage, one-sixth were in the action stage, and one-fourth were either in the preparation or contemplation stage at the beginning of the program. Fourteen percent of the participants were in the precontemplation stage, which rate is considered as relatively high. Participants displayed significant improvement in motivation during the study ($\chi^2_{(4)}=10.795$, $p=.029$).

Investigating the predictors of weight loss, more variables had significant, however, weak association with weight loss ($r/r_s \leq .23$). The change of cognitive restraint proved to be the only exception, which had moderately strong association with weight loss ($r=.40$, $p<.001$). According to the results of the multivariate binary logistic regression analysis, only the increase in cognitive restraint had significant predictive value in relation to successful weight loss (OR=6.80, OR CI₉₅: 3.02-15.29, $p<.001$).

Limitations

We do not have any data about those people who refused participation in the study, thus we are not aware of the nature of the potential selection bias. There were no objective measure of anthropometric data, thus, the BMI scores should be interpreted carefully. Participant recruitment, psycho-education, and follow-up study were done by the same person (the author), thus, we have to take into consideration the presence of the Pygmalion-effect. Generalization of our results is limited to non-invasive, professional inpatient weight loss treatment program for obese people. We could not examine the inpatient treatment of the Lipidology Department and the intervention effect of the psycho-education in randomized controlled clinical trial settings. Considering that only half of the respondents participated in the follow-up study ($n=175$), the low sample size may resulted in the decline of statistical power. In the follow-up study the time interval was six months that contained two data collection waves. Therefore, on the one hand, we could detect the changes only in short-term and on the other hand, we could test only the short-term predictive value of weight loss predictors.

Conclusion

Results support the explanatory variables and risk factors of obesity-related quality of life, depression, and self-esteem. According to the study results, the one-week long intensive inpatient weight loss treatment in the Lipidological Department of Szent Imre Hospital is a cost-effective way for facilitating weight loss in obese people. More than one-third of the participants achieved clinically significant (at least 5%), successful weight loss. Weight loss enhanced improvements in depression and self-esteem. The psycho-educational session – based on behaviour therapy – proved to be beneficial; thus, considering the completion of the present treatment protocol with this extra element would be useful.

Summary

In agreement with the second generation studies of the psychological correlates of obesity (Friedman & Brownell, 1995) we examined the explanatory variables and risk factors of obesogenic eating behaviours, body dissatisfaction, quality of life, self-esteem, and depression. Our results support the findings of previous research studies. Moreover, we were also able to point out new associations between beliefs relating to obesity, depression, and quality of life. Following the latest model of psychological correlates of obesity (Gatineau & Dent, 2011) we also examined the role of some mediator and moderator variables. Our results supported the mediator role of body dissatisfaction in connection with obesity and psychological distress, and also the moderator role of gender in connection with some psychological correlates of obesity.

The result of the two weight management programs can be summarized briefly as follows: during the III. „Together – Easier” workplace lifestyle changing program – organized by OEFI – the participants lost average 2.4% (SD=4.19%) of their body weight measured at the beginning. Nineteen percent of the participants achieved clinically significant ($\geq 5\%$) weight loss. The average weight loss was lower comparing with the results reported by Brownell et al. (1984). However, considering the fact that the study did not target weight loss, but lifestyle change, the rate of successful weight loss may be regarded as high. The follow-up participants of the intensive inpatient weight loss treatment in the Lipidologic Department of Szent Imre Hospital lost average 4.3% (SD=6.30%) of their baseline body weight six months after the inpatient treatment. Forty percent of the participants achieved clinically significant weight loss. The degree of weight loss exceeds the results that were reported by a standard hospital care cited earlier (Goulis et al., 2004).

Our findings are in accordance current international literature (e.g. Blaine et al., 2007) which pointed out the relationship between weight loss and the improvement of depression and the global self-esteem. Although, the associations were weak, considering that both potential confounding variables and baseline assessment of mental health variables were controlled in the study, the results were significant. These significant results support that even moderate weight loss has a great impact on psychological functioning (e.g. Fabricatore, 2007).

Examining the predictors of clinically significant weight loss, we did not find any remarkable results. Among the participants of the lifestyle changing program, younger age and gender (male) were identified as predictors of successful weight loss. There was a relationship between the degree of increasing in cognitive restraint six months after the inpatient weight loss program and successful weight loss. These results are in accordance with previous studies emphasizing the difficulties of predicting successful weight loss (which is sometimes even impossible; Teixeira et al., 2005).

Our studies are of great importance, because of the examination of wide spectrum of the psychological correlates of obesity. Applying the structural equations model we could exceed the exploratory examination of the instrument's construct validity. Applying the modern multivariate statistical analyses, we were able to investigate the hypothesized relationships with the control of potential background variables, and we also could test complex models. Exceeding the examination of statistical significance we also tried to estimate the clinical significance of the changes in the variables of eating behaviours and mental health (Jacobson & Truax, 1991). Moreover, the prospective study design made it possible to reveal causal relationships.

Conclusions

With the use of adapted questionnaires into Hungarian, several obesity-related construct can be assessed in a valid and reliable way. The Three-Factor Eating Questionnaire Revised 21-Items, the Body Shape Questionnaire – Short Form, and the Goals and Relative Weights Questionnaire are suitable for widespread distribution in Hungary. We have to consider the re-composition of one of the items in Obesity Beliefs Scale. Nevertheless, it is also suitable in the present form for the national research purposes. The Obesity Adjustment Survey – Short Form is not recommended in the present form for widespread distribution. To reveal the factorial structure of the instrument it has to be tested in additional samples as well. The construct validity of the measure still has to be examined. The Social Support in Weight Loss Efforts Scale – developed by the author – has good internal consistency and seems to be a promising measure; however, it still has to be validated. According to the representative data of Eurobarometer research (2009), 23% of people above the age of 15 years, exercise on a regular basis in Hungary. According to the results of the national Health Survey of European Population (2009), 50% of the adult population are not doing intensive exercise, one-third do not exercise at least on a moderate level, and one-fifth do not even walk ten minutes per day (KSH, 2010). Considering these data, the exercise rate of our study participants was high. This rate was especially high among those participants who were in the inpatient treatment. However, most of the inpatient participants were obese ($BMI \geq 30$ kg/m²), 40% suffered from some kind of joint disease, and almost half of them (45%) were under treatment because of at least three comorbid disorders of obesity. We can draw the conclusion that the Exercise: Stages of Change (Short Form) may overestimate the rate of those people who are exercising on a regular basis, thus, the validation of this measure is of utmost importance.

During the examination of the the psychological correlates of obesity, body dissatisfaction proved to be a significant explanatory variable. Body image improvements can increase the level of self-esteem and decline psychological symptoms (Rosen, 2000). Moreover, it also enhances the development of more adaptive eating behaviours and physical activities (Palmeira et al., 2009). Psychological distress may contribute to unhealthy food choices and sedentary lifestyle (e.g. de Wit et al., 2010). Negative affects may interfere weight loss treatment seeking behaviour (Sarwer et al., 2005) and successful weight loss (Grilo et al., 1989). Mental health improvements may enhance behavioural changes relating to body weight control and successful weight loss (Palmeira et al., 2009). Considering the above-mentioned facts, our results have important clinical implications for Hungarian professional weight loss treatments as well.

Results relating to the determinants of obesogenic eating behaviours may contribute to give valuable strongholds to initiate intervention programs. For instance the results highlighted the relationship between body dissatisfaction and restrained eating in a sample of mostly normal weight young women. This association emphasizes the importance of education relating to healthy eating. The association between emotional eating, depression, and anxiety proved the necessity of completion of eating related educational programs with stress-reducing elements.

Our results indicate that the increase of cognitive restraint of eating facilitates successful weight loss. We do not agree with Konttinen et al. (2009) that the negative relationship between nutritional statement and cognitive restraint could be understood as a successful body weight control for obese people. We also do not accept the interpretation of aboved-mentioned authors about that the positive association between nutritional statement and cognitive restraint in normal weight people would be the evidence of restraint theory (Herman & Polivy, 1975) and would reflect to the problems in relation to weight control.

We believe that the TFEQ-R21 Cognitive Restraint Scale measures health conscious eating, instead of rigid and a self-torturing diet. This eating pattern can be considered as an adaptive eating behaviour that enhances the prevention of weight gain in the obesogenic environment (Hill & Peters, 1998).

Beliefs play an important role in the high-impact models explaining health behaviour – (e.g. Prochaska et al., 1992). Investigating the obesity-related beliefs, we found that overweight people and women were more likely to endorse the costs of the maintenance of ideal body weight. Higher educational level were connected with the higher levels of the agreement of social and aesthetical beliefs. Beliefs could be changed by health education and health development, which finally decreases unhealthy behaviours and increases health behaviours commitment (Swift et al., 2007). Our results may contribute to the optimization of interventions targeting the change of beliefs. Testing the predictors of intentional weight loss, the obesity-related beliefs did not have any significant predictive value neither for degree of weight loss, nor successful weight loss. One explanation can be that the OBS did not measure concrete behaviours, but general beliefs relating to obesity; moreover, the items were composed in third-person. If the items would be recomposed in first-person singular form it would increase the involvement in connection with the consequences of obesity. The agreement with self-relevant statements could serve as a motivation for change. It is also possible that weight loss interventions may change the beliefs – like eating behaviours as well –, and these kind of change has a predictive value for weight loss. However, this possibility has to be investigated.

Considering the disadvantageous consequences of negative affects on body weight management efforts, our results relating to the association between weight loss and mental health improvements are promising (de Wit et al., 2010; Grilo et al., 1989; Sarwer et al., 2005). Further studies should examine the contribution of intentional weight loss to mental health improvement in randomized controlled trials, focusing on factors that could be involved in inpatient weight loss treatments.

The „Together – Easier” workplace lifestyle changing team competition – was developed by the National Institute for Health Development – is a promising, less intensive and cost-effective interventional possibility that involves many people. The program is beneficial even for normal weight people, as the reduction of body fat percent may decrease the incidence rate of comorbid disorders. Results from the inpatient weight loss treatment at the Lipidological Department of Szent Imre Hospital are equivalent with international data, or proved to be even more successful in terms of weight loss (Giel et al., 2008; Goulis et al., 2004; Jeffery et al., 2003). Moreover, this treatment also resulted in remarkable changes in eating behaviours, as participants reported increased cognitive restraint and decreased tendency towards maladaptive eating pattern (e.g. emotional eating and uncontrolled eating). Long-lasting changes would help to maintain the achieved body weight and also would enhance further weight loss. Considering the limited number of available weight loss and weight management interventions in Hungary, the distribution of the above-mentioned models would be useful.

Our results contribute to the better understanding of obesity and also provide guidance in obesity treatment in Hungary. Our studies have founded further research and serve as a basis for the design of randomized controlled trials. The development of a protocol based on cognitive-behaviour therapy in Hungary is of utmost importance. Initial steps have been made so far (Géczy & Perczel, 1988; Vizin et al., 2010). Furthermore, under the aegis of positive psychology (Keyes & Haidt, 2006) we believe that the next steps should be the exploration of protective factors besides the examination of risk factors of the psychological correlates of obesity.

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Lectures

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Posters

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