BODY DISSATISFACTION, BODY MASS INDEX AND SELF-DETERMINATION AMONG UNIVERSITY STUDENTS FROM HUNGARY, LITHUANIA AND SLOVAKIA

original article

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SUMMARY

Hricová L, Orosová O, Benka J, Petkeviciene J, Lukács A. Body Dissatisfaction, Body Mass Index and Self-determination among University Students from Hungary, Lithuania and Slovakia

Objective: Body dissatisfaction is an important indicator of eating disorders and quality of life. It has been connected to body mass in a number of studies and has also been explored in the context of self-determination theory. However, previous research has focused mainly on women and as such there is a lack of information about men's body dissatisfaction. The main aim of this study was to explore the relationship between body dissatisfaction and body mass index (BMI) of both male and female university students. Further aims were to explore the differences in body dissatisfaction according to BMI category and according to the level of self-determination.

Method: In total 1493 university students (74.4% women) from Slovakia, Hungary and Lithuania participated in an online survey within the Student Life Cohort in Europe (SLiCE) study providing information on self-determination, body dissatisfaction and self-reported height and weight.

Results: The findings showed that there is a linear relationship between body dissatisfaction and BMI with a similar pattern for males and females. Furthermore, significant differences in

SOUHRN

Hricová L, Orosová O, Benka J, Petkeviciene J, Lukács A. Nespokojnosť s telom, body mass index a seba-determinácia u vysokoškolských študentov z Maďarska, Litvy a Slovenska

Cieľ: Nespokojnosť s telom je dôležitým indikátorom porúch stravovania a kvality života. V množstve štúdií bola nespokojnosť s telom spájaná s telesnou hmotnosťou a bola tiež skúmaná v kontexte seba-determinačnej teórie. Avšak, predošlé výskumy sa zameriavajú predovšetkým na ženy a informácií o nespokojnosti s telom u mužov je nedostatok. Hlavným cieľom tejto štúdie bolo preskúmať vzťah medzi nespokojnosťou s telom a body mass indexom (BMI) u vysokoškolských študentov a študentiek. Ďalším cieľom bolo preskúmať rozdiely v nespokojnosti s telom vzhľadom na BMI kategórie a vzhľadom na úroveň seba-determinácie.

Materiál a metóda: Spolu 1493 vysokoškolských študentov (74.4% žien) zo Slovenska, Maďarska a Litvy sa zúčastnilo na on-line prieskume v rámci štúdie Student Life Cohort in Europe (SLiCE) a poskytlo informácie o seba-determinácii, nespokojnosti s telom a sebou posudzovanej výške a váhe.

Výsledky: Zistenia ukázali, že existuje lineárny vzťah medzi nespokojnosťou s telom a BMI podobného charakteru u mužov aj žien. Navyše boli zistené signifikantné rozdiely v nespokojnos-

body dissatisfaction according to both BMI category and the level of self-determination were found. The highest body dissatisfaction was found among overweight and obese students as well as among students with a lower level of self-determination.

Conclusion: This study confirms that body dissatisfaction is directly related to BMI and inversely related to self-determination in both male and female university students. These results could be helpful in psychological prevention and intervention strategies.

Key words: body dissatisfaction, body mass index, self-determination, university students.

ti s telom vzhľadom na BMI kategóriu aj úroveň seba-determinácie. Najvyššia nespokojnosť s telom bola zistená u študentov s nadváhou a obezitou, ako aj u študentov s nižšou úrovňou seba-determinácie.

Záver: Táto práca potvrdzuje, že nespokojnosť s telom je pozitívne asociovaná s BMI a negatívne asociovaná so seba-determináciou u vysokoškolských študentov aj študentiek. Tieto výsledky môžu byť nápomocné pri psychologických prevenčných a intervenčných stratégiách.

Kľúčové slová: nespokojnosť s telom, body mass index, seba-determinácia, vysokoškolskí študenti.

INTRODUCTION

Dissatisfaction with one's physical appearance in the context of subjective weight perception and actual weight is a complex phenomenon determined by multiple variables on various levels. Socio-demographic determinants such as gender and age, BMI and individual differences in reacting to cultural ideals of body image and social pressures have all been recognized to influence various aspects of dissatisfaction with one's body. These factors may play an important part in unhealthy patterns of eating behaviors and eventually contribute to the development of eating disorders. A number of recent studies have identified body weight and body dissatisfaction as the most important contributing factors to eating disorders.[1–4] Even though dissatisfaction with one's weight does not necessarily lead to unhealthy eating behavior nor explain the mechanism or association, high body dissatisfaction has been found to be associated with poor life satisfaction[5] and poor quality of life.[6] Age is an important determinant influencing body dissatisfaction. The period of transition to university is accompanied by many changes as a result of greater responsibility and establishing new relationships. A person often finds him or herself in a completely new social environment. This period of life change may affect the increased sensitivity to self-perception in appearance or social comparisons. The period of university studies has been identified as especially risky for the manifestation of eating disorders.[7] As a result, this study is focused on first year university students.

The current research addressing unhealthy patterns of eating behavior and body dissatisfaction has mainly focused on female populations.[2,4.8,9,10] There is substantial empirical support for the relationship between BMI and body dissatisfaction among women. Garber et al.[2] have found that there is a strong association of BMI and body dissatisfaction among adolescent girls. However, the gender specific approach has been criticized by some authors arguing that this is no longer a female gender issue and body image concerns have changed in recent years. They can also be found among men, who are becoming more engaged in behavior connected to improving their body image. This has been caused by media influence which purports the muscular male body ideal.[11] The pattern of causal factors however, is likely to function in a different way for each gender. The nature of association between weight perception and body mass index among men might be very different to that of women. Forrester-Knauss and Zemp Stutz[12] have found that for women, higher BMI is a predictor of weight dissatisfaction. While underweight (BMI below 18.5) women reported a lower level of weight dissatisfaction than normal weight (BMI between 18.5 and 25) women, overweight and obese (BMI over 25) women were much more dissatisfied with their weight than normal weight women. For men, the results were different in that not only overweight and obese men but also underweight men reported higher weight dissatisfaction than normal weight men.[12,13] Additionally, in a specific context Garber et al.[2] found that adult female military recruits with a BMI between 18.5 and 21.9 (which is normal weight) reported the lowest prevalence of weight dissatisfaction when compared to women with BMI under 18.5 (which indicates underweight) or that over 22. The highest rate of weight dissatisfaction was reported among women with

a BMI over 23.5, which is still normal weight but closer to overweight (BMI 25 to 30). Pilafova, Angelone & Bledsoe[14] who adopted a similar definition to body satisfaction have shown its high negative correlation with BMI for both men and women. Thus, „the less individuals weigh compared to their height, the better they would feel about their outward appearance" (p. 28).[14] Millstein et al.[15] also found an association between higher BMI and body dissatisfaction for both genders. However, Tiggemann,[16] who studied young male and female Australian students, found a weaker association between BMI and body dissatisfaction among women compared to men. The association between BMI and weight dissatisfaction for women seems to be linear while for men with a more muscular body ideal, a low BMI does not satisfy their perception of weight.[12,13] Thus, gender differences in respect to the association between BMI and body dissatisfaction are still not fully clear.[12] However, men are still not a typical sample when exploring features of body image despite their body concern increasing. Even though there is only a little prevalence of eating disorders for men, where body dissatisfaction acts as a risk factor, poor body satisfaction can also reduce other aspects of psychical functioning such as quality of life.[6]

At the level of socio-cultural factors, many psychosocial variables have also been addressed focusing on the different operationalizations of body or weight dissatisfaction such as negative weight perception, body image dissatisfaction and body esteem. Current research defines body image as the way in which a person thinks about, perceives and feels about his or her body.[17] In this context, only a few studies have explored the differences in how individuals react to social pressures according to their level of self-determination. Within the Self-determination theory one's behavior is defined as self-determined or autonomous if regulated by the self. This means it is not subject to external contingencies or social pressures as in cases of controlled conditions. Autonomous behavior is also congruent with one's values and interests.[18] This has been positively associated with many health promoting behaviors, well-being, vitality, positive affect[19] and lower stress.[20] On the other hand, lower autonomy has been related to lower self-esteem, lower body satisfaction and a stronger drive for thinness among women.[21] Self-determination could indeed be an important protective factor against the influence of social pressures. In particular, self-determination, which indicates lower susceptibility to extrinsic controls, has been shown to be a buffer against sociocultural influences about body image. This has been shown to be associated with greater weight satisfaction among young adult women.[9,22] Autonomous and intrinsic motivation can protect individuals from pursuing a thin ideal of body image which represents a socially conditioned extrinsic value.[1] Moreover, high perceived autonomy in women appears to protect them against sociocultural body image pressures. Thus, it seems that high levels of self-determination represent a buffer for women against the internalization of the pressure to be thin.[9] High self-determination also negatively predicted body dissatisfaction in a mixed gender sample of aerobics instructors.[23] However, further research of perceived autonomy and autonomous functioning is needed to understand its connection with body dissatisfaction.

This study addresses three main aims. The first aim was to explore the relationship between BMI and body dissatisfaction for both men and women. Since a new trend has been observed in men who are becoming more concerned with body image it is expected that the relationship between BMI and weight perception exists in similar strength for both males and females. The second aim addressed the differences in body dissatisfaction across the three BMI categories. It was hypothesized that higher dissatisfaction would be positively related to higher BMI. And finally, the third aim was to explore the body dissatisfaction differences according to the self-determination level for both genders. It was expected that more self-determined individuals are more satisfied with their bodies.

METHOD

Participants

The participants of this study were 1493 first year university students from Hungary, Lithuania and Slovakia. The average age of the students from Hungary was 21.36, SD=5.71, the students from Lithuania 20.00, SD=2.83 and the students from Slovakia 19.61 SD=1.42.

The descriptive statistics of the sample are reported in Table 1.

Measures

The Body Dissatisfaction Scale, EEICA (Escala de Evaluación de la Insatisfacción Corporal para Adolescentes)[24] measures the frequency of behavior connected to body care, body perception and social influences. The EEICA consists of 32 questions (e.g.: "*How often do you think your friends generally have a body more beautiful than yours*?", "*How often do you analyze the composition of calories from food, to control what is fat?*", "*How often do you think women of your age seem to be fatter than you?*") with 6 responses on a Likert scale (1 – never to 6 – always). From the questions, 7 need to be reversed. The score is calculated from the sum of the responses. The higher the score, the greater the young person's body and weight dissatisfaction is.[24] In the current study, the internal consistency of the scale measured by Cronbach's Alpha was 0.94 (0.94 Slovakia, 0.95 Lithuania, 0.94 Hungary) which shows very good internal consistency. The questionnaire was compiled in English and translated into the local languages using back translation. The research team reviewed any cases of disagreement and the authors familiar with the respective languages made the final decisions.

Table 1. ***Distribution of participants by gender, country and body mass index***

	Gender		Country			BMI category			
	Male	Female	HU	LT	SK	U	N	O	Obese
n	382	1111	504	477	512	200	1106	151	36
Percent	25.6	74.4	33.8	31.9	34.3	13.4	74.1	10.1	2.4

Note: HU – Hungary, LT – Lithuania, SK – Slovakia; U – underweight, N – normal weight, O – overweight

The Self-determination Scale (SDS)[25] is a 10-item self-report instrument that measures two domains of self-determination: Self contact and Choicefullness – 5 items per subscale. Subjects are asked to choose which of two statements feels truer, using a scale ranging from 1 – only A feels true to 5 – only B feels true. *(e.g.: "A. I always feel like I choose the things I do. – B. I sometimes feel that it's not really me choosing the things I do."; "A. My emotions sometimes seem alien to me. – B. My emotions always seem to belong to me.").* From the items, 5 need to be reversed. The score for the subscales is computed by averaging the item scores for the 5 items within each subscale where they are then computed into an overall SDS score. A higher score indicates a higher level of self-determination. In this study, Cronbach's alpha coefficient for internal consistency of SDS reached an acceptable value of 0.78 (0.79 Slovakia, 0.77 Lithuania, 0.79 Hungary). The same process of translation was used as for the EEICA scale with the final decisions made by the authors familiar with the respective language. Three groups of participants were identified according to their level of self-determination through the function of Visual binning using the method of cut points (Equal Percentiles) in SPSS. This divided the sample into 3 groups (individuals with lower self-determination: total score of SDS ≤ 7.40; with middle self-determination: TS between 7.41 and 8.60; and with higher self-determination: TS ≥ 8.61).

Body mass index is calculated by weight in kilograms divided by height in meters squared. Values are age and gender independent for adults and are used to classify underweight, overweight and obese individuals.[26] Even when this measurement is self-reported, its reliability has been shown when participants' anonymity is guaranteed.[27] The participants were divided into 4 groups according to the BMI category following the WHO standards. Individuals with a BMI below 18.5 were defined as underweight, a BMI of between 18.5 and 24.99 as normal weight, with a BMI between 25 and 29.99 as overweight and with a BMI of 30 and over as obese. For further analyses, the obese and overweight were grouped together as no significant differences in weight perception or self-determination between those two groups were found.

Procedure

This analysis is based on data from the Student Life Cohort in Europe (SLiCE), a multinational longitudinal study among first year university students from several European countries. Nine universities took part in the study: four universities in Kaunas, Lithuania, the University of Budapest and the University of Miskolc in Hungary and three universities in Kosice, Slovakia. The total number of the first year students attending all the above mentioned universities was 16369 (6366 in Slovakia, 5793 in Lithuania and 4210 in Hungary). At each location, students were asked to complete self-administered online questionnaires. The universities in Lithuania and Slovakia provided access to e-mails of all enrolled students. The project was introduced to students during regular lectures and seminars as well as through additional ways such as flyers, notice boards, student newspapers, websites and student associations. The students were directly invited to participate in the survey by e-mail. The Hungarian students were informed using university newsletters and other formal and informal channels. Following that, they registered on www.slice-study.eu and filled in the questionnaire. Student participation in the study was voluntary and anonymous. Permission to conduct the study was granted by the ethical commissions of participating institutions. In total, the sample consisted of 2690 students (814 Slovakia, 936 Lithuania and 940 Hungary). 1493 students who responded to each question of interest were entered into our analyses.

Statistical analysis

The data were analyzed using IBM SPSS Statistics (version 20.0). A significance level of $p<.05$ was adopted for the analyses. In order to explore the relationship between BMI and weight perception for men and women separately, Pearson correlation coefficients were used. Cohen's[28] criteria for determining the strength of the relationship was adopted, where r=.10 to .29 is a small correlation, r=.30 to .49 a medium correlation and r=.50 to 1 a large correlation. The r scores were converted into z scores and the observed value of z (z_{obs} value) was calculated to find out if there was a significant difference in these two values of correlation coefficients. A Kruskal-Wallis test was used separately for men and women to see if there were significant differences in body dissatisfaction according to the 3 BMI categories and 3 self-determination levels. In addition, follow-up Mann-Whitney U tests were used to examine the significant differences in body dissatisfaction between each group combination. A Bonferroni adjustment to the alpha level was applied and after that the alpha level .017 for each comparison was set.

Tests were done to reveal if there were any differences in weight perception and BMI between the participants from Hungary, Lithuania and Slovakia. The non-parametric Kruskal-Wallis test revealed no significant differences between the 3 countries in weight perception nor BMI, which was only on the verge of significance (Table 2). According to these results, it was decided to explore all the countries together. A Mann-Whitney U test revealed significant differences in weight perception and BMI between males and females. A different pattern was found according to gender where females reported greater weight dissatisfaction and males reported higher BMI (Table 2).

Table 2. ***Characteristics of the body dissatisfaction and BMI (median, interquartile range) by country and by gender***

Group	Body dissatisfaction		BMI	
	Mdn	IQR	Mdn	IQR
Hungary	91	48.75	21.30	3.92
Lithuania	91	47.5	21.05	3.72
Slovakia	89	39	20.96	3.68
Male	76	26.25	22.59	3.95
Female	97	46	20.70	3.47

Note: Statistical parameters for body dissatisfaction across countries differences: χ^2=.67, p=.72; Statistical parameters for BMI across countries differences: χ^2=6.05, p=.05; Statistical parameters for body dissatisfaction gender differences: U=129239.5, Z=–11.41, p<.001, r=–.3; Statistical parameters for BMI gender differences: U=137148, Z=–10.33, p<.001, r=–.28

RESULTS

The Pearson correlation coefficient revealed a significant relationship between body dissatisfaction and BMI for males, r=.42, p<.001. There was also a significant relationship found between body dissatisfaction and BMI for females, r=.54, p<.001. These results indicate that high levels of body mass are associated with higher levels of body dissatisfaction for both males and females. These two relationships were found to be linear and quite similar in their strength. However, the correlation for men was slightly lower and can be defined only as a medium one while the correlation coefficient for women indicated quite a strong relationship.[28] The value z_{obs}=–.05 indicated no significant differences between the two correlation coefficients. Thus, it can be seen that the positive association between BMI and body dissatisfaction has a similar strength for male and also for female university students.

A further objective in this study was to explore the differences in body dissatisfaction between underweight, normal weight and overweight and obese individuals for both males and females. The statistically significant differences in body dissatisfaction for male and female university students between the three groups with a different BMI category are shown in Table 3. The results showed significant differences in body dissatisfaction between each of the three BMI groups for women. The underweight female group scored significantly lower in body dissatisfaction when compared to the normal weight female group, U=34771, z=–11.31, p<.001, with a medium effect size r=–.36 and also to the overweight and obese female group, U=1221, z=–12.42, p<.001 with a large effect size r=–.73. The normal weight women reported a significantly lower median score in body dissatisfaction when compared to the overweight and obese women, U=19360.5, z=–9.43, p<.001, with a medium effect size r=–.31. For men, significant differences in body dissatisfaction were revealed among underweight men and overweight and obese men, U=5977, z=–6.48, p<.001 with a medium effect size r=–.34. The normal weight men reported a significantly lower median score in body dissatisfaction when compared to the overweight and obese men, U=348, z=–3.41, p<.001, with a medium effect size r=–.34. There were no significant differences in body dissatisfaction between the underweight men and normal weight man, U=2541, z=–.04, p=.98.

Tests were carried out to examine whether more self-determined students were more satisfied with their body than less self-determined students. The results revealed significant differences for female and male university students in body dissatisfaction between the three groups with a different self-determination (SD) level (Table 4). When comparing the groups, the results indicated that the median score of body dissatisfaction for each group of self-determination was significantly different from each other. The female group with lower SD had significantly higher median scores of body dissatisfaction when compared to the group with middle SD, U=60517, z=–7.26, p<.001, with a small effect size r=–.25, and the group with higher SD, U= 33753, z=–10.84, p<.001, with a medium effect size r=–.40. Furthermore, the median score of body dissatisfaction for the group with middle SD was significantly higher when compared to the group with higher SD, U=41061, z=–4.51, p<.001, with a small effect size r=–.18. For males, the group with lower SD had significantly higher median scores of body dissatisfaction when compared to the group with middle SD, U=7038.5, z=–3.63, p<.001, with a small effect size r=–.22 and the group with higher SD, U=4204, z=–6.16, p<.001, with a medium effect size r=–.39. Furthermore, significant differences were revealed also in the median score of body dissatisfaction between men with middle SD and higher SD, U=5735.5, z=–2.41, p=.016, with a small effect size r=–.16.

In addition, the differences in self-determination according to BMI category for both sexes were tested. Significant differences were observed for females only. The results are presented in Table 5. The underweight women had significantly higher median scores when compared to the overweight and obese women, U=7618, z=–3.09, p<.05, with a small effect size r=–.18. No significant differences were found between the underweight and normal

Table 3. ***Median and interquartile range of body dissatisfaction score by BMI and gender***

Gender	BMI category	n	Mdn	IQR
Female	Underweight	182	71	26
	Normal weight	822	99	41
	Overweight and obese	107	136	35
Male	Underweight	18	75	12.25
	Normal weight	284	73	22.75
	Overweight and obese	80	94	45.25

Note: Statistical parameters for females: χ^2=228.27, p<.001; Statistical parameters for males: χ^2=42.98, p<.001

Table 4. ***Median and interquartile range of body dissatisfaction score by self-determination level and gender***

Gender	SD level	n	Mdn	IQR
Female	lower SD	461	112	47
	middle SD	371	94	40
	higher SD	279	82	38
Male	lower SD	144	83	33
	middle SD	131	75	26
	higher SD	107	69	16

Note: Statistical parameters for females: χ^2=129.64, p<.001; Statistical parameters for males: χ^2=38.05, p<.001. SD – Self-determination

Table 5. ***Median and interquartile range of self-determination score by BMI and gender***

Gender	BMI category	n	Mdn	IQR
Female	Underweight	182	7.9	1.8
	Normal weight	822	7.8	1.8
	Overweight and obese	107	7.4	2
Male	Underweight	18	7.4	2.2
	Normal weight	284	8	1.8
	Overweight and obese	80	8	1.8

Statistical parameters for females: χ^2=10.14, p=<.01; Statistical parameters for males: χ^2=1.35, p=.51

weight female university students U=70115.5, z=–1.33, p=.19 nor the normal weight and overweight and obese female university students, U=4234.5, z=–1.47, p=.14. For males, there were no significant differences in self-determination according to the BMI categories at all.

DISCUSSION

The current findings provide empirical support for the linear relationship between BMI and body dissatisfaction among both males and females. Although the correlation of the two variables was slightly higher in the female group, there was no significant difference between the male and female groups in the strength of the relationship. It was found that for both males and females, the lower the weight in respect to height, the lower the body dissatisfaction that was reported. These findings are in line with previous studies[15,29,30] that found a similar association of higher BMI and body dissatisfaction for both genders.

The results showed the highest level of body dissatisfaction for men and women among overweight and obese individuals. However, Forrester-Knauss and Zemp Stutz's[12] and Watkins, Christie and Chally's[13] findings differed slightly from the current study as not only overweight and obese men but also underweight men reported higher body and weight dissatisfaction than normal weight men in their studies. In the current study, there were no significant differences in weight perception between underweight men and men with normal weight although underweight men were less dissatisfied with their body when compared to overweight and obese men. This discrepancy can be explained by the fact that more questions in the EEICA scale report dissatisfaction with fat mass rather than body dissatisfaction in general. Garber et al.[2] found that the lowest prevalence of weight dissatisfaction was reported by women with a BMI between 18.5 and 21.9, which indicates a normal weight, when compared to other women. In this study however, underweight women were significantly more satisfied with their body and weight when compared to normal weight and overweight and obese women. However, it must be mentioned that Garber et al.[2] focused exclusively on adult female military recruits which limits the possibility of direct comparisons with this sample which used students. The current study's results are in line with previous studies,[12,31] which found that underweight women reported a lower level of dissatisfaction than normal weight women and overweight and obese women were more dissatisfied with their body and weight than normal weight women.

A further aim of this study was to explore the differences in body dissatisfaction according to different levels of self-determination. All students with lower self-determination scored significantly higher on body dissatisfaction when compared to those with middle and higher levels of self-determination. Previous studies[9,22] highlight the importance of global self-determination which gives a buffering effect against sociocultural pressures about body image. These pressures are associated with greater body dissatisfaction of young adult women. The more self-determined women are, the less they perceive and internalize the sociocultural pressure about body image.[10] Further studies based on Self-determination theory have shown that basic psychological needs satisfaction directly negatively predicts body dissatisfaction in adolescent girls[8] and may have a protective function on the appearance-contingent self-worth development in female university students.[32] In addition, autonomy, when measured as need satisfaction, was found to negatively predict body image concerns of male and female aerobic instructors.[23] Yet, research of body dissatisfaction in the context of Self-determination theory has been predominantly applied to the female population. In the current research, body dissatisfaction was found to be more positive with a higher level of self-determination for women as well as for men. Lower self-determination for both men and women indicated higher levels of body dissatisfaction. There was also a difference found in the level of self-determination between underweight and overweight and obese female university students. The group of underweight women scored higher on self-determination in comparison to the group of overweight and obese women. Female university students with a higher than normal BMI were found to be less autonomous and more dissatisfied with their body when compared to those with a lower than normal BMI.

The presented findings have shown that respondents with higher trait self-determination, regardless of gender, show fewer problems with their body satisfaction then those with lower self-determination. This suggests that incorporating the concept of self-determination in intervention programs applied in the context of body image could be beneficial. According to the SDT theory, individuals with higher self-determination are more likely to act in accordance with their own values and are less likely to be controlled by socio-cultural pressures. This can be assumed regarding body image[9] as well. The theoretical concept of SDT might thus constitute a useful framework for devising future prevention or intervention programs which aim to improve body satisfaction. In addition, encouraging healthier eating habits and weight friendly diets, in turn decreasing BMI, may lead to a reduction of body dissatisfaction. Future research could focus on the difference in the effect of self-determination and body dissatisfaction for underweight, normal weight and overweight and obese individuals using parametric analysis. It would also be interesting to explore the role of self-determination within sociocultural pressures towards body dissatisfaction for both genders. In order to confirm the protective function of self-determination within sociocultural pressure, additional analysis including other variables, such as the influence of the media, family or friends on body image and internalization of societal ideals of body appearance would be needed.

It is also important to acknowledge the limitations of this study. Firstly, the self-reported measurement of weight and height, which might not be absolutely accurate and consistent to objectively measured weight and height, could reinforce the relationship between BMI and body dissatisfaction. In addition, BMI does not distinguish between fat mass and muscle mass. Secondly, it cannot be ruled out that our sample contained cases with clinical eating disorders, whether restrictive or compulsive covering both extreme ends of the BMI spectrum. This imposes certain limitations regarding the generalization of

the findings. However, the measures used in the study did not allow for a reliable identification of cases with an eating disorder in the sample. Thirdly, even though the used measures showed sufficient reliability in every country for exploring the current research questions it must be mentioned that further validation of these methods in the population of university students might improve their psychometric qualities. Furthermore, obtaining a representative sample remains a problem especially when using an online data collection.[33] For example Coomley[34] in his paper on online surveys reported that the common range of response rate varies from 9% to 48%. The response rate of this study was at the lower end of this range. This is also a limiting factor regarding the generalization of the results, especially because the respondents who chose not to participate in the study may differ from those who did. Although it is worth mentioning that studies examining the problems with online data collection do exist and have not revealed significant differences regarding the scores in psychological variables when compared to paper based questionnares.[35,36] Finally, the online data collection did not allow the creation of groups which were proportional according to gender and BMI categories. This did not allow parametric statistical methods to be used. Longitudinal data would be appropriate to address the causality of the relationship of BMI, Self-determination and body dissatisfaction which is also an option for future studies.

CONCLUSIONS

This study is a contribution to resolving the inconsistencies in the relationship between BMI and body dissatisfaction for men and women. These results support the previous claim that a positive relationship exists and a similar strength for both sexes was found. While previous studies have explored the association between self-determination and body dissatisfaction among women, this study has shown the negative association for both sexes. It is important to focus on men's body dissatisfaction given that men are becoming more engaged in body image concerns. Although there is little prevalence of eating disorders among men where body dissatisfaction plays a definite role, poor body satisfaction has been shown to also reduce other meaningful aspects of psychical functioning as quality of life. The current results could be helpful in psychological prevention strategies focusing on the improvement of body and weight perception of less self-determined male and female university students which in turn could decrease the risk of developing an eating disorder.

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