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Symptoms of sexuality-related disorders in the group of overweight and obese women

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Summary

Aim. The aim of the study was to assess the presence of symptoms of sexuality-related disorders (S-RD) in a group of overweight and obese women and the relationship of these symptoms with maladaptive attitudes and beliefs about food, the severity of anxiety and depressive symptoms, alcohol consumption, difficulties in emotional regulation, and the general quality of life.

Method. The study group (SG) consisted of 44 overweight/obese women, the control group (CG) consisted of 51 women with normal body weight, all aged 18–40 years. The following were used: *Sexological Questionnaire*, *Eating Attitude Test*, *Eating Beliefs Questionnaire*, *Alcohol Use Disorder Identification Test*, *Hospital Anxiety and Depression Scale*, and the *Quality of Life Questionnaire*.

Results. SG showed more severe S-RD symptoms, including sexual dysfunctions and sexual preferences disorders, as compared to CG. In the SG there were more significant correlations between S-RD and the studied variables, especially in the area of difficulties with emotional regulation. Negative and permissive dietary beliefs were significant for S-RD in SG, while positive beliefs were significant in CG. Additionally, the number of S-RD symptoms predicted the quality of life.

Conclusions. The results indicate a relationship between excessive body weight and greater severity of S-RD symptoms, as well as a relationship between the symptoms of S-RD with clinical variables and with the quality of life. Further research exploring the mechanisms of the observed relationships is necessary.

Key words: obesity, sexual disorders, quality of life

Introduction

The World Health Organization (WHO) indicates that the current percentage of obese people in the European population constitutes an epidemic. It is estimated that the problem of overweight and obesity affects 59% of adults, and the prevalence of obesity alone may be around 23% [1]. Excessive body weight significantly increases the risk of diseases such as type 2 diabetes, cardiovascular disease and certain types of cancer [2]. Obesity most often occurs in the form caused by excessive energy supply, which has been assigned the code of E66.0 in the current ICD-10 classification used in Poland [3].

Obesity may have a negative impact on the quality of somatic, mental and interpersonal functioning [4]. Significant, two-way relationships have been demonstrated between obesity and the severity of, among others, depression and anxiety symptoms [5] and eating disorders [6]. Obese individuals, especially women, have reduced self-esteem and reduced self-confidence, do not approve of their appearance and have a negative body image as early as in childhood [7]. They have also been shown to have deficits in emotional regulation and a reduced ability to identify and correctly interpret signals from the body, which can lead to overeating and weight gain [8].

The issue of reduced quality of sex life may concern 67% of people with excessive body weight [9]. Although there are some studies addressing sexuality-related disorders in obese women, they typically target specific populations (e.g., before/after bariatric surgery [10]) or focus on groups of those in whom obesity is only one aspect of a larger clinical picture (e.g., groups of women with PCOS [11]). There is also a lack of studies that, apart from the presence of the aforementioned disorders and the level of anxiety-depressive symptoms (see e.g., [10, 12]), would simultaneously assess the quality of life and emotional regulation strategies, as well as food-related beliefs that may lead to excessive eating. Therefore, the main aim of this study was to assess the above-mentioned areas and their relationships in the group of overweight and obese women in comparison to the control group of women with a normal body mass index (BMI). As numerous scientific studies indicate the relationship between sexual disorders and the quality of life of women with various diagnoses (e.g., [13–15]), the other goal was to verify the role of body mass and symptoms of sexuality-related disorders in predicting the level of quality of life.

Material

Due to the SARS-COV-2 pandemic, the questionnaire study was conducted online. Recruitment to the study was carried out using social messengers and through internet forums associating people struggling with overweight and obesity. The control group was matched adequately to the study group in terms of age, education, professional status, and place of residence.

111 women aged 18–40 were examined. People diagnosed with endocrine and gynecological disorders, eating disorders, personality disorders, obsessive-compulsive disorders, and addictions were excluded from the analyzes. This was conducted based

on the information contained in the socio-demographic survey (which concerned, among others, occurrence of mental disorders and endocrine and gynecological disorders) as well as high scores of the clinical scales used in this study, constituting an additional verification. Finally, the responses of 95 women were included – 32 women with obesity and 12 women with overweight (SG; study group) and 51 women with a normal body mass index (CG; control group). There was no statistically significant difference in age and level of education between the two groups.

In the study group, the mean age was 25.50 years (*SD* = 5.40). These were mostly women with higher (45.5%) or secondary (50.0%) education, living in large cities (65.9%), professionally active (40.9%) and/or studying (52.3 %). The BMI mean was 34.14 (*SD* = 6.14).

In the control group, the mean age was 23.27 years (*SD* = 2.79). These were mostly women with higher (49.0%) or secondary (51.0%) education, living in large cities (66.7%), professionally active (60.8%) and/or studying (39.2%). The BMI mean was 21.31 (*SD* = 1.59).

Method

Eating Attitude Test

Eating Attitude Test (EAT-26 [16]) consists of 26 items rated on a scale from 0 to 6, which reflects the frequency of specific experiences. Obtaining a result above 20 points indicates harmful eating behaviors and a high probability of eating disorders occurrence.

Eating Beliefs Questionnaire

Eating Beliefs Questionnaire (EBQ-18 [17]) consists of 18 items assessing the beliefs about food, grouped into sub-scales of negative, positive and permissive beliefs. Assessment is made on a scale from 1 to 5, with the growing number indicating a greater severity of pathology in terms of beliefs about eating.

Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression Scale (HADS [18]) consists of 14 items, 7 of which are used to assess the level of anxiety symptoms and the remaining 7 – the level of depressive symptoms. Ratings are made on a scale from 0 to 3. The higher the number of points obtained, the greater the severity of symptoms.

Alcohol Use Disorder Identification Test

Alcohol Use Disorder Identification Test (AUDIT [19]) is used to assess the risk of harmful alcohol consumption. It consists of 10 questions. A score of 1 to 7 suggests low-risk alcohol consumption, a score of 8 or more suggests risky alcohol consump-

tion, and a score of 15 or more indicates a likelihood of addiction. Increased results suggest the need for a specialist consultation.

Sexological Questionnaire

Sexological Questionnaire (SQ [20]) consists of 30 items that are used to independently assess the occurrence of symptoms of disorders specified in the ICD-10 classification in the following categories: sexual dysfunctions (F52), gender identity disorders (F64), sexual preferences disorders (F65), and psychological and behavioral disorders associated with sexual development and orientation (F66). The answer is given by assessing the occurrence of the experience (e.g., vaginal dryness) and the higher scores mean greater number of symptoms. The general score is a representation of the number of occurring symptoms.

Quality of Life SF-36 Questionnaire

Quality of Life SF-36 Questionnaire – the Polish version (SF-36 [21]) is used for subjective quality of life assessment, consisting of 11 questions containing 36 statements. The answer is given by selecting the most appropriate variant. The tool enables the calculation of both the general quality of life index and a separate result for its mental and physical dimensions. More points mean a lower quality of life.

Difficulties in Emotion Regulation Scale

Difficulties in Emotion Regulation Scale (DERS [22]) consists of 36 items, grouped into sub-scales: “lack of emotional awareness”, “lack of emotional clarity”, “impulse control difficulties”, “difficulty engaging in goal-directed behavior”, “nonacceptance of emotional responses”, “limited access to emotion regulation strategies”. Ratings are made on a scale of 0 to 5, which reflects the frequency of specific experiences. The higher the score, the greater the severity of the difficulty.

Statistical analyzes

Statistical analyzes were performed using the IBM SPSS Statistics 28 package. Intergroup comparisons were made using the non-parametric Mann-Whitney *U* test. The magnitude of the effects was calculated using Glass’s rank two-series correlation coefficient. Correlation analysis was performed using the non-parametric Spearman’s rho coefficient. Effects with a value <0.3 were interpreted as weak, effects in the range 0.3–0.5 as average, and effects >0.5 as strong. The Fisher transformation of the correlation coefficient estimators was also used; it was checked whether the correlation coefficients calculated in individual groups show statistically significant differences.

In the next step, the results of the study group and the control group were analyzed together. Before performing multiple regression analysis, the distribution of standardized model residuals was analyzed for outliers, which excluded one observation.

Another analysis confirmed that the data did not contain any outliers (standardized residual min. = – 2.66; standardized residual max. = 2.42). Residual values were not correlated with each other (Durbin-Watson statistics = 2.24). Based on the histogram of standardized residuals and the normal probability plots, it was confirmed that the distribution of standardized residuals was close to the normal distribution. The distributions of standardized predicted values confirmed that the data met the assumptions of homogeneity of variances.

The data were also checked for multilinearity (VIF = 1.27–2.44; Tolerance = 0.41–0.79). Some quantitative variables did not have distributions close to the normal distribution. However, the absolute values of skewness and kurtosis were below 2.00 [23], therefore they were considered acceptable and placed into regression models without log-transformation. The fit of the model was checked on the basis of the corrected *r2* value.

Results

Comparison between the research groups

A higher number of symptoms of sexuality-related disorders, including sexual dysfunctions and sexual preferences disorders, was observed in the study group when compared to the control group. The severity of incorrect eating attitudes as well as anxiety and depressive symptoms was also higher. In the study group, greater difficulties in emotion regulation was observed, especially in terms of the lack of emotional awareness and the lack of emotional clarity, impulse control difficulties, and limited access to emotion regulation strategies. More maladaptive eating beliefs in all the studied categories, as well as a lower quality of life (both physical and mental) were also found in the study group (Table 1).

Table 1. **Comparison between the groups in terms of the studied variables (AUDIT, EAT-26, HADS, SF-36, EBQ-18, KS, DERS)**

	Control group (n = 51)			Study group (n = 44)						
	M	SD	Me	M	SD	Me	U	Z	p	r
BMI	21.31	1.59	21.22	34.14	6.14	33.03	0.00	-8.37	<0.001	0.86
AUDIT	5.14	3.99	4.00	4.95	3.76	4.00	1096.00	-0.20	0.845	0.02
EAT-26	8.35	8.19	6.00	15.68	10.90	13.00	645.00	-3.57	<0.001	0.37
HADS										
Anxiety symptoms	7.69	4.18	7.00	9.77	4.07	10.00	788.00	-2.50	0.012	0.26
Depressive symptoms	4.10	4.03	3.00	8.09	4.31	9.00	545.00	-4.32	<0.001	0.44

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SF-36										
Physical dimension of the quality of life	16.06	13.29	11.00	25.89	16.09	22.50	699.00	-3.16	0.002	0.32
Mental dimension of the quality of life	25.30	12.91	22.00	35.75	13.77	33.00	638.00	-3.61	<0.001	0.37
Quality of life index	49.67	24.45	43.00	73.22	29.52	67.00	594.50	-3.94	<0.001	0.40
EBQ-18										
Negative eating beliefs	11.20	4.78	10.00	17.34	6.38	17.00	494.00	-4.70	<0.001	0.48
Positive eating beliefs	11.63	5.00	11.00	19.32	5.75	21.00	368.00	-5.64	<0.001	0.58
Permissive eating beliefs	11.16	4.12	11.00	15.14	5.56	15.00	647.50	-3.55	<0.001	0.36
General score (maladaptive eating beliefs)	33.98	11.52	35.00	51.80	14.65	51.00	379.00	-5.55	<0.001	0.57
SQ										
Symptoms of sexual dysfunctions	4.76	4.40	4.00	7.05	4.61	6.00	785.00	-2.52	0.012	0.26
Symptoms of gender identity disorders	3.55	1.25	4.00	3.80	1.36	4.00	967.00	-1.20	0.231	0.12
Symptoms of sexual preferences disorders	0.73	1.40	0.00	2.36	3.04	1.00	735.00	-3.14	0.002	0.32
Symptoms of psychological and behavioral disorders associated with sexual development and orientation	0.76	1.11	0.00	1.23	1.78	0.00	1015.00	-0.90	0.369	0.09
General score	6.25	5.42	4.00	10.82	7.70	10.50	704.50	-3.12	0.002	0.32

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DERS										
Nonacceptance of emotional responses	15.92	6.53	15.00	18.39	7.27	17.50	898.00	-1.67	0.094	0.17
Difficulty engaging in goal-directed behavior	17.65	4.44	18.00	18.57	4.96	20.00	963.00	-1.19	0.234	0.12
Lack of emotional awareness	11.75	4.07	11.00	13.82	4.75	13.00	813.00	-2.32	0.021	0.24
Impulse control difficulties	15.02	5.65	13.00	18.11	7.07	18.00	844.50	-2.07	0.038	0.21
Limited access to emotion regulation strategies	22.37	8.00	21.00	25.59	7.67	27.00	840.50	-2.10	0.035	0.22
Lack of emotional clarity	10.78	4.55	10.00	13.91	5.23	13.00	695.50	-3.19	0.001	0.33
General score	5.14	3.99	88.00	108.39	26.36	113.00	739.50	-2.86	0.004	0.29

AUDIT – Alcohol Use Disorder Identification Test; EAT-26 – Eating Attitude Test; HADS – Hospital Anxiety and Depression Scale; SF-36 – Quality of Life Questionnaire; EBQ-18 – Eating Beliefs Questionnaire; SQ – Sexological Questionnaire; DERS – Difficulties in Emotion Regulation Scale

Correlations

In the study group, a number of statistically significant correlations were observed between the result of the total number of symptoms declared in the *Sexological Questionnaire* (and all four groups of sexual disorders and dysfunctions examined by it) and the severity of harmful alcohol consumption, incorrect attitudes towards food and maladaptive eating beliefs, individual dimensions of quality of life, as well as the severity of anxiety and depressive symptoms and difficulties in regulating emotions (Table 2). The most significant correlations were observed for the number of symptoms of sexual dysfunctions. In the control group, fewer statistically significant correlations were observed and they concerned the total number of symptoms declared in the *Sexological Questionnaire* and two groups of sexual disorders and dysfunctions examined by it – symptoms of sexual dysfunctions and symptoms of gender identity disorders (Table 3).

Comparison of correlation coefficients in both study groups showed statistically significant differences in relation to the relationship between: (a) the level of harmful

alcohol consumption and the number of declared symptoms of sexual preference disorders, (b) difficulties in engaging in goal-directed behavior and symptoms of sexual preferences disorders as well as symptoms of psychological and behavioral disorders associated with sexual development and orientation, (c) between the number of declared symptoms of sexual preferences disorders and the lack of emotional awareness. In each case, the correlations were statistically significant in the study group and insignificant in the control group.

Table 2. **Correlations between the results of the Sexological Questionnaire (SQ) and the results of other tools (AUDIT, EAT-26, HADS, SF-36, EBQ-18 and DERS) in the study group**

	Symptoms of sexual dysfunctions	Symptoms of gender identity disorders	Symptoms of sexual preferences disorders	Symptoms of psychological and behavioral disorders associated with sexual development and orientation	General Score
BMI	0.112	-0.210	0.310*	0.062	0.170
AUDIT	0.307*	0.233	0.574***[a]	0.363*	0.466***
EAT-26	0.333*	0.112	0.136	-0.128	0.238
HADS					
Anxiety symptoms	0.613***	0.295	0.333*	0.161	0.572***
Depressive symptoms	0.398**	0.133	0.220	0.035	0.353*
SF-36					
Physical dimension of the quality of life	0.426**	0.138	0.330*	0.049	0.442***
Mental dimension of the quality of life	0.452**	0.215	0.406**	0.099	0.488***
Quality of life index	0.473***	0.164	0.424**	0.079	0.503***
EBQ-18					
Negative eating beliefs	0.363*	0.020	0.276	0.043	0.332*
Positive eating beliefs	0.213	0.211	0.290	0.164	0.293
Permissive eating beliefs	0.180	0.016	0.317*	0.091	0.210

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General score (maladaptive eating beliefs)	0.317*	0.124	0.363*	0.159	0.353*
DERS					
Nonacceptance of emotional responses	0.444**	0.401**	0.295	0.110	0.421**
Difficulty engaging in goal-directed behavior	0.426**	0.790***	0.437**[a]	0.410**[a]	0.501***
Lack of emotional awareness	0.224	-0.155	-0.300[a]	-0.089	-0.013
Impulse control difficulties	0.364*	0.273	0.170	0.025	0.302*
Limited access to emotion regulation strategies	0.598***	0.451**	0.356*	0.194	0.571***
Lack of emotional clarity	0.432**	0.348*	0.220	0.169	0.343*
General score	0.593***	0.449**	0.286	0.133	0.494***

AUDIT – Alcohol Use Disorder Identification Test; EAT-26 – Eating Attitude Test; HADS – Hospital Anxiety and Depression Scale; SF-36 – Quality of Life Questionnaire; EBQ-18 – Eating Beliefs Questionnaire; SQ – Sexological Questionnaire; DERS – Difficulties in Emotion Regulation Scale.

[a] – the value of the correlation coefficient for given variables differs statistically significantly from the value of this coefficient for the same variables in the control group at the level <0.05.

* – correlation significant at the level <0.05; ** – correlation significant at the level <0.01; *** correlation significant at the level <0.001.

Table 3. **Correlations between the results of the Sexological Questionnaire (SQ) and the results of other tools (AUDIT, EAT-26, HADS, SF-36, EBQ-18 and DERS) in the control group**

	Symptoms of sexual dysfunctions	Symptoms of gender identity disorders	Symptoms of sexual preferences disorders	Symptoms of psychological and behavioral disorders associated with sexual development and orientation	General Score
BMI	-0.076	-0.119	-0.008	-0.025	-0.010
AUDIT	0.277*	-0.169	0.113[a]	0.121	0.277*
EAT-26	0.316*	0.056	0.085	0.188	0.324*

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HADS					
Anxiety symptoms	0.401**	0.324*	0.145	0.107	0.430**
Depressive symptoms	0.472***	0.244	0.237	0.143	0.489***
SF-36					
Physical dimension of the quality of life	0.407**	0.039	0.142	0.165	0.417**
Mental dimension of the quality of life	0.366**	0.383**	0.189	0.183	0.421**
Quality of life index	0.477***	0.296*	0.199	0.191	0.503***
EBQ-18					
Negative eating beliefs	0.229	0.172	0.045	0.147	0.266
Positive eating beliefs	0.309*	0.251	0.169	0.150	0.354*
Permissive eating beliefs	0.109	0.253	-0.061	0.217	0.157
General score (maladaptive eating beliefs)	0.253	0.239	0.071	0.263	0.320*
DERS					
Nonacceptance of emotional responses	0.224	0.594***	-0.084	-0.023	0.206
Difficulty engaging in goal-directed behavior	0.230	0.890***	-0.070[a]	-0.039[a]	0.187
Lack of emotional awareness	0.207	0.032	0.133[a]	0.076	0,194
Impulse control difficulties	0.132	0.291*	-0.034	0.198	0.158
Limited access to emotion regulation strategies	0.461***	0.483***	0.184	0.143	0.482***

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Lack of emotional clarity	0.283*	0.230	0.140	0.053	0.319*
General score	0.414**	0.603***	0.092	0.125	0.409**

AUDIT – Alcohol Use Disorder Identification Test; EAT-26 – Eating Attitude Test; HADS – Hospital Anxiety and Depression Scale; SF-36 – Quality of Life Questionnaire; EBQ-18 – Eating Beliefs Questionnaire; SQ – Sexological Questionnaire; DERS – Difficulties in Emotion Regulation Scale.

a – the value of the correlation coefficient for given variables differs statistically significantly from the value of this coefficient for the same variables in the control group at the level <0.05.

* – correlation significant at the level <0.05; ** – correlation significant at the level <0.01; *** correlation significant at the level <0.001.

Predictive models of the quality of life

Multiple regression analysis was used to verify whether the number of symptoms of sexuality-related disorders would predict the quality of life levels. The results of the study group and the control group were analyzed together. Taking into account the research confirmed by literature [24] and by this study, the relationship between excessive body weight, high levels of anxiety and depressive symptoms and maladaptive eating attitudes with the quality of life, the level of these variables was controlled in the performed statistical analysis.

In Model 1, the BMI status (normal vs. overweight or obese) significantly predicted the quality of life. In Model 2, the level of anxiety and depressive symptoms were significant predictors of the quality of life, while the effect of BMI status and abnormal eating attitudes were insignificant. On the other hand, in Model 3, after adding the symptoms of sexuality-related disorders as a predictor, the effect of the level of anxiety and depressive symptoms remained significant. Model 3 showed a good fit to the data (Table 4).

Table 4. **Predictive models of quality of life**

		B	SE	B	t	95% CI for B	Corrected R^2	F
Model 1	Constant	49.67	3.78		13.13***	[42.15–57.18]	0.15	17.26***
	Status BMI	23.24	5.59	0.40	4.15***	[12.13–34.35]	$\Delta R^2 = 0.16$	$\Delta F = 17.26$***
Model 2	Constant	16.77	4.27		3.92***	[8.28–25.26]	0.68	49.30***
	BMI status	2.51	4.07	0.04	0.62	[-5.58–10.59]	$\Delta R^2 = 0.53$	$\Delta F = 50.66$***
	HADS-anxiety	2.26	0.59	0.33	3.83***	[1.09–3.44]		
	HADS-depression	3.32	0.59	0.52	5.63***	[2.06–4.29]		
	EAT-score	0.23	0.18	0.08	1.24	[-0.29–0.43]		

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Model 3	Constant	16.58	4.05		4.09***	[8.53–24.63]	0.71	46.14***
	BMI status	0.78	3.89	0.01	0.21	[-6.93–8.53]	$\Delta R^2 = 0.04$	$\Delta F = 11.11$***
	HADS-lęk	1.74	0.58	0.25	3.00**	[0.59–2.90]		
	HADS-depression	3.17	0.56	0.25	5.67***	[2.06–4.29]		
	EAT-score	0.07	0.18	0.03	0.39	[-0.29–0.43]		
	SQ-score	0.97	0.29	0.23	3.33***	[0.39–1.55]		

CI = confidence interval.

* p <0.05; ** p <0.01; *** p <0.001

Discussion

In this study, overweight and obese women showed a higher severity of improper eating attitudes, anxiety and depressive symptoms, which is widely supported by literature [25, 26]. This group was characterized by greater difficulties in regulating emotions than in the control group, especially in terms of the lack of emotional awareness and emotional clarity, impulse control difficulties, and limited access to the emotion regulation strategies. Similar results were found in other studies (including [8]), at the same time indicating the relationship of these difficulties with emotional eating [27]. In this study, more maladaptive eating beliefs in all studied categories, including those which allowed and positively assessed excessive eating, were observed in overweight or obese women. The quality of life declared in this group, both physical and mental, was also significantly lower than in the control group, which is consistent with the reports of other authors (including [25, 28]).

The main aim of this study was to compare the occurrence of symptoms of sexuality-related disorders between those women who are overweight or obese and those with a normal BMI. A higher general number of symptoms of sexuality-related disorders, symptoms of sexual dysfunctions and symptoms of sexual preferences disorders was observed in the study group when compared to the control group. This is consistent with reports by many other authors indicating the presence of numerous sexual dysfunctions in obese people (e.g., [28–30]) and a lower quality of sexual life [31]. On the other hand, in the study by Kadioglu et al. [32], the frequency of sexual dysfunctions in the group of obese women was not higher than in the group of women with a normal BMI, yet it is worth noting that the participants were premenopausal women, exceeding the average age of women in our study by more than 10 years. No other reports have been identified that would assess the presence of symptoms of sexual preferences disorders in obese individuals, and therefore taking into account the presence of symptoms of these disorders in the group of people with excessive body weight in this study is its innovative aspect.

The occurrence of symptoms of sexual dysfunctions in the group of overweight or obese women correlated with maladaptive beliefs and attitudes in the area of nutrition

and alcohol consumption, as well as with the severity of depressive and anxiety symptoms and the presence of a number of problems in the area of emotional regulation. This seems intuitive, considering that the presence of sexual dysfunction symptoms is related to the somatic factors, which as a consequence of high BMI are also the cause of dysfunction symptoms, and psychological factors. Negative body image and the resulting fear of intimacy may lead to avoiding sexual contacts and experiencing increased fear of them, which in turn has a negative impact on the desire, disturbs genital reactions, makes it difficult or impossible to achieve sexual satisfaction.

Interestingly, most of these correlations were also observed in the control group, which suggests that the above variables may constitute risk factors or an effect of sexual dysfunctions symptoms, also, regardless of body weight. These results are consistent with those obtained by Dunkley and Brotto [33], who observed a relationship between maladaptive eating attitudes and beliefs and the presence of sexual dysfunctions in the non-clinical population. The relationship between sexual dysfunction and depression and anxiety is confirmed by numerous reports (including [25, 34]). In the matter of alcohol consumption, there are reports indicating that higher amounts of consumed alcohol may be a risk factor for the development of sexual dysfunctions in women [35]. It may also be used by some, as a way to reduce sexual inhibition [36]. Although the meta-analysis carried out by Allen and Walter [37] did not show a clear relationship between alcohol consumption and the presence of sexual dysfunctions in women as opposed to men, for both genders, the important role of a healthy life style (reducing alcohol, increasing physical activity, introducing a healthy diet) is emphasized in order to prevent and treat possible sexual dysfunctions in both genders [38].

Interestingly, in overweight or obese women, the presence of negative and permissive dietary beliefs (related to the inability to control their own eating and consent to start or continue excessive eating) turned out to be significant for the occurrence of symptoms of sexuality-related disorders, and in the case of women with a normal BMI – the same occurred in the presence of positive eating beliefs (related to the beneficial role of food as a factor reducing the level of negative emotions). In overweight or obese women, there were also notably more significant correlations between the symptoms of sexual dysfunctions and difficulties in emotional regulation (in 5 out of 6 sub-scales) than in the control group (in 1 out of 6 sub-scales – "limited access to emotion regulation strategies"). These results seem to fit into the well-established theory of emotional eating as a strategy of coping with negative emotions [39], often through high-calorie food or alcohol, which have a positive connotation as a means of reducing tension [40], which may also entail limited access to other regulatory strategies. However, for overweight or obese individuals, there are many more difficulties with regulating emotions, and the presence of beliefs about the lack of control and resources can make both food and alcohol the main means of coping with these difficulties, also increasing the body mass level. Nevertheless, the posted hypotheses require verification in subsequent studies.

With regard to the symptoms of gender identity disorders, similarly significant relationships were observed in both researched groups, mainly with various

difficulties in emotional regulation. In the areas of symptoms of psychological and behavioral disorders associated with sexual development and orientation and disorders of sexual preferences, statistically significant correlations were observed only in the group of women with excessive body weight. In the former, greater severity of symptoms coexisted with greater difficulty in engaging in goal-directed behavior and consuming more alcohol. Symptoms of sexual preferences disorders, on the other hand, correlated with BMI, severity of anxiety symptoms, alcohol consumption, maladaptive eating beliefs (mainly permissive beliefs), limited access to emotion regulation strategies and difficulty in engaging in goal-directed behaviors. Attention is drawn to the significant relationship between the presence of symptoms of sexual preferences disorders and a lower quality of life, both mental and physical, which indicates the importance of this area, which – according to the authors' knowledge – has not been analyzed so far in the context of obesity, similarly to the other parameters mentioned in this paragraph. The aforementioned correlations may be a clue to explaining the observation of a greater number of symptoms of sexual preferences disorders in the study group. These symptoms, which indicate engaging in non-normative sexual behavior, may be, just like difficulties in regulating emotions, difficulties in impulse control and limited access to emotion regulation strategies, disturbances in the broadly understood emotional and drive spheres. The greater number of symptoms of sexual preferences disorders in overweight women and its correlations with excessive alcohol consumption and permissive eating habits can also be explained by referring to the similarities in terms of increased demand for stimulation and reward-related stimuli processing. Studies indicate that in obese people, the increased neural activation during reward processing is also observed in the absence of food-related stimuli [41]. However, the hypothesis needs to be verified in future research.

Due to the fact that in both researched groups, the severity of symptoms of sexuality-related disorders significantly correlated with worse quality of life, both physical and mental, a decision was made to check whether the result of the *Sexological Questionnaire* could predict the overall level of quality of life. The best fit was found in the model in which significant predictors of the quality of life turned out to be: the level of depressive and anxiety symptoms and the occurrence of symptoms of sexuality-related disorders, explaining as much as 71% of the variance. By analyzing this model, a hypothesis that requires further verification may be made that perhaps the excessive BMI itself is not important for the quality of life. It is rather the factors that often accompany it (such as the lack of self-acceptance, negative beliefs about one's own weight, experiencing discrimination or social withdrawal), which are associated with an increase in depression and anxiety symptoms [42] and may lead to the development of sexual dysfunctions [43], which in turn could lower the quality of life. It is worth noting, that in case of maladaptive emotional regulation strategies such as "over-eating" them, the above factors may also increase the risk of maintaining a high or further increasing body weight. Consistent with this hypothesis are the results obtained by Lillis et al. [44], who in a longitudinal study showed, that although the initial level of self-stigma was not associated with a subsequent reduction in BMI,

a reduction in at least one aspect of self-stigma and self-devaluation was associated with a greater loss of body weight. However, the relationships between obesity and sexual functioning and the quality of life are multidimensional and multifaceted. This is confirmed, for example, by the study by Bond et al. [45], in which 6 months after undergoing bariatric surgery, 68% of female sexual dysfunctions diagnosed before surgery, resolved, and sexual functioning improved significantly, regardless of the level of weight loss.

In this study, only the variables that were considered key to the number of symptoms of sexual dysfunction were taken into account, thus not considering additional factors that may mediate the relationship between obesity and sexuality-related disorders, such as the aforementioned self-stigma, level of self-esteem, body image or experience of discrimination [42, 46]. Therefore, further research aimed at deepening the knowledge in the analyzed areas is advisable.

Conclusions

Overweight or obese women show a higher occurrence of symptoms of sexuality-related disorders (especially sexual dysfunctions and sexual preference disorders) than women with a normal body weight. These symptoms are associated with difficulties in other areas of functioning and constitute a significant predictor of the quality of life. Further research is necessary to deepen the understanding of the mechanisms of the observed relationships.

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