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Sexual Dysfunction in Women with Migraine and Overweight/Obesity: Relative Frequency and Association with Migraine Severity

Dale S. Bond¹, Jelena M. Pavlović², Richard B. Lipton², J. Graham Thomas¹, Kathleen B. Digre³, Julie Roth⁴, Lucille Rathier⁵, Kevin C. O’Leary¹, E. Whitney Evans¹, and Rena R. Wing¹

¹Alpert Medical School of Brown University/The Miriam Hospital Weight Control and Diabetes Research Center, Providence, RI, USA

²Montefiore Headache Center, Albert Einstein College of Medicine/Montefiore Medical Center, Bronx, NY, USA

³University of Utah Health Sciences Center, Salt Lake City, UT, USA

⁴Department of Neurology, Alpert Medical School of Brown University/Rhode Island Hospital, Providence, RI, USA

⁵Department of Psychiatry and Human Behavior, Alpert Medical School of Brown University/The Miriam Hospital

Abstract

Background/Objective—Previous studies suggest that migraine might be associated with female sexual dysfunction (FSD), although this association may be complicated by overweight/obesity. To disentangle relationships of migraine and obesity with FSD, we examined: 1) FSD rates in women who had migraine and obesity with a matched sample of women with obesity who were free of migraine; and 2) associations between indices of migraine severity and FSD in a larger sample of participants with migraine and overweight/obesity, controlling for important confounders.

Clinical Trial Registration Number: ClinicalTrials.gov Identifier: NCT01197196

Conflicts of Interest:

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Methods—Women with migraine and obesity seeking behavioral weight loss treatment to decrease headaches (n=37) and non-migraine controls (n=37) with obesity seeking weight loss via bariatric surgery were matched on age (± 5 years), body mass index (BMI; ± 3 kg/m²), and reported sexual activity during the past month. Both groups completed the Female Sexual Function Index (FSFI), with a validated FSFI-total cutoff score used to define FSD. In participants with migraine and overweight/obesity (n=105), separate logistic regression models evaluated associations of migraine attack frequency, intensity, and duration with odds of having FSD, controlling for age, BMI, depression, and anxiety.

Results—On average, participants and matched controls had severe obesity (BMI=42.4 $\pm$ 3.8 kg/m²; range=35–49.9) and were 37.3 $\pm$ 7.2 years of age (range=22–50). FSD rate did not differ between migraine participants and controls (56.8% vs. 54.1%, $p=.82$). In the larger sample of participants with migraine and overweight/obesity (38.2 $\pm$ 7.8 years of age; BMI=34.8 $\pm$ 6.4 [range=25–50 kg/m²]; 8.0 $\pm$ 4.3 migraine days/month, maximum pain intensity=5.9 $\pm$ 1.4 on 0–10 scale; average attack duration=18.3 $\pm$ 9.7 hours), FSD was not associated with attack frequency ($p=.31$), pain intensity ($p=.92$), or attack duration ($p=.35$), but was associated with more severe anxiety symptoms ($p<.017$).

Conclusions—Rates of sexual dysfunction did not differ in severely obese women with and without migraine. Moreover, indices of migraine severity were not associated with increased risk of FSD in women with overweight/obesity. Replication of present findings in wider populations of women with migraine and of both normal-weight and overweight/obese status are warranted.

Keywords

Female sexual dysfunction; women; migraine; obesity; pain; depression

INTRODUCTION

Female sexual dysfunction (FSD) includes both physiological and psychological symptoms reflecting impairments in different phases of the sexual response cycle or pain experienced during intercourse.^{1, 2} FSD is recognized as a medical condition, involving a complex interplay of neuroendocrine, vascular, and psychosocial components, which can adversely impact the health and well-being of individuals, couples, and families.^{1–3} Although research over the past decade has linked different neurologic diseases and pain syndromes to increased risk of FSD^{4–7}, the relationship between migraine and FSD has been a topic of relatively recent study and is not well understood.

To date, a small group of studies have assessed the relationship between migraine and one or more dimensions of female sexual function^{8–13}; yet, only a subset have measured FSD using validated instruments such as the Female Sexual Function Index (FSFI).^{8, 10, 12} The FSFI is a brief, self-report questionnaire measure that assesses sexual function across six domains (i.e. sexual desire, arousal, lubrication, orgasm, pain, and satisfaction) and classifies FSD based on a validated total cutoff score.^{14, 15} Findings from studies using the FSFI measure consistently suggest that FSD is common in women who have migraine, with rates (68%–90%)^{8, 10, 12} exceeding those reported in general populations (15%–60%).^{16, 17} However, it

is unclear whether higher FSD rates in women with migraine are due more to migraine and indices of migraine severity or other contributors to FSD.

One likely contributor is obesity, which now affects 40% of U.S. women and is associated with more frequent migraine attacks and increased migraine prevalence, particularly in women and those younger than 50 years.^{18–20} Additionally, FSD rates range from 50%–86% in obese women, obesity is associated with worse sexual function in women who have FSD, and significant remission of FSD occurs after weight loss.^{21–26} Thus, it is plausible that the relationship between migraine and FSD is complicated by obesity.

In effort to disentangle the relationships of migraine and obesity with FSD, we used the FSFI to compare FSD rates in women who had both obesity and migraine with a sample of women matched for age and obesity who were free of migraine. Next, we examined whether prospectively-measured indices of migraine severity (attack frequency, intensity, duration) were associated with greater odds of having FSD, after controlling for important confounders (i.e. age, BMI, depression, and anxiety), in a larger sample of women with overweight/obesity who were seeking behavioral weight loss treatment to reduce their headaches.

METHODS

Design, Participants and Procedures

This cross-sectional study included 2 samples who reported being sexually active during the past month on the FSFI measure. The first included women with migraine and obesity, compared to women matched for age and obesity who were free of migraine. Migraine participants were adult women 50 years who reported sexual activity during the past month on the FSFI questionnaire, had severe obesity ($BMI \geq 35 \text{ kg/m}^2$) and a neurologist-confirmed diagnosis of migraine according to International Classification of Headache Disorders (3rd edition beta criteria)²⁷, and were seeking behavioral treatment to lose weight and reduce headaches as part of the Women's Health and Migraine (WHAM) trial (ClinicalTrials.gov NCT01197196).²⁸ Control participants were selected from a historical sample of women with obesity seeking bariatric surgery who enrolled in a previous study designed to assess pre- to postoperative changes in sexual functioning.²² These participants were determined to not have migraine, based on their responses to items on a health history questionnaire indicating that they did not experience frequent headaches nor took medications to treat migraine. From the larger sample of 105 women who had migraine and overweight/obesity, 37 participants were successfully matched 1:1 with controls on pre-specified criteria: age (± 5 years), BMI ($\pm 3 \text{ kg/m}^2$ units).

The second sample included a larger subset of participants from the WHAM trial.²⁸ Only participants who reported sexual activity during the past month (74.4% of entire sample) were included given that FSD classification necessitates engagement in solitary or partner-related sexual activities.^{29,30} Participants were recruited between November 2012 and May 2016 from both the community (via direct mailings, Internet sites, and social media outlets) and neurological medicine clinics. Women interested in participating were instructed to contact the research center using a provided telephone number or Web site address. To be

initially eligible, women had to report ≥ 3 migraine attacks and between 4 and 20 headache days, have BMI $\leq 50 \text{ kg/m}^2$, and be 18–50 years of age. Additionally, participants could not be presently/recently pregnant and had to agree not to initiate or change medications used to treat migraine headaches, alleviate depression, or provide oral contraception within 2 months of study entry. Eligible participants were invited to a study orientation where they completed informed consent, had their weight status and migraine diagnosis confirmed by research staff and the study neurologist, completed FSFI and other questionnaires, and began recording their headache activity for 28 consecutive days using a smartphone and accompanying Web-based headache diary application that was provided to them. For the current study, which involves a secondary analysis of baseline data from the WHAM trial, participants with episodic (1–14 headache days) and chronic (15–20 headache days) migraine, based on reported frequency over the 28-day diary monitoring period, were included. The study protocol was approved by the Rhode Island Hospital Institutional Review Board (Providence, RI, USA). All authors had full access to study data throughout data collection, analysis, and manuscript preparation. The primary author (DSB) assumes full responsibility for integrity of the data.

Measures

Female sexual dysfunction (FSD)—Sexual function and FSD rate were measured using the FSFI¹⁴ in participants with migraine (both samples) and controls. The FSFI is a 19-item multidimensional self-report questionnaire measure that includes 6 subscales: 1) sexual desire (assessed as frequency and level of desire), 2) sexual arousal (assessed as frequency, level, confidence and satisfaction), 3) lubrication (assessed as frequency, difficulty, frequency of maintaining, and difficulty in maintaining), 4) orgasm (frequency, difficulty, and satisfaction), 5) sexual satisfaction (assessed as amount of closeness with the partner, sexual relationship, and overall sex life), and 6) sexual pain (assessed as pain frequency during and after vaginal penetration). The FSFI yields scores for each domain and a total score with higher scores indicating better sexual function (score range: sexual desire, 1.2–6; sexual satisfaction; 0.8–6; sexual arousal, lubrication, orgasm, and sexual pain, 0–6; total 2–36). The FSFI has demonstrated psychometric and clinical validity and high temporal consistency for each of the individual domains. A validated cutoff score was used to identify participants with FSD (≤ 26.55).^{14, 15}

Indices of Migraine Severity—Participants recorded their headache activity for 28 consecutive days using a smartphone equipped with a Web-based headache diary application.²⁸ At the end of each day, participants indicated whether a headache occurred. When a headache occurred, participants rated the maximum headache pain intensity [0 “no pain” to 10 “pain as bad as you can imagine] and start and stop time to indicate duration of the headache attack. These data were automatically transmitted to the research center where they were checked by staff on a daily basis. Participants were contacted in the event that data received were incomplete or unclear. Participant data were summarized as average attack frequency (assessed as number of migraine days/month), maximum pain intensity, and duration in hours.

Psychological characteristics

Depression: The 20-item Center for Epidemiologic Studies Depression Scale (CES-D) assessed frequency of depressive symptoms over the past week in participants with migraine.³¹ Depression is associated with higher rates of FSD in populations with migraine^{10, 32} and moderates the association between migraine and obesity.³³ CES-D scores range from 0 to 60, with higher scores indicating more severe depressive symptoms. The CES-D has high internal consistency, reliability, and both predictive and concurrent validity with respect to pain.^{31, 34}

Anxiety: The 7-item Generalized Anxiety Disorder Scale (GAD-7) assessed severity of anxiety symptoms over the previous 2-week period in participants with migraine.³⁵ Anxiety, like depression, is shown to moderate the relationship between migraine and obesity.³³ Scores range from 0 to 21 with higher scores indicating more severe anxiety symptoms. This measure is shown to accurately and reliably assess anxiety in primary care settings and the general population.^{35, 36}

Anthropometric characteristics—Height and weight were measured using a wall-mounted Harpenden stadiometer (Holtain, Ltd., Crosswell, Crymyh, Pembs, UK) and calibrated digital scale (Tanita BWB 800: Tanita Corporation of America, Inc, Arlington Heights, IL, USA) in migraine participants (both samples) and controls. Body mass index (BMI) was calculated from these measures using the formula: $BMI (kg/m^2) = weight (kg) / (height [m])^2$. In migraine participants only, waist circumference was measured at the midpoint between the highest point of the iliac crest and lower part of the costal margin at the mid-axillary line.

Demographic characteristics—Age, marital status, race/ethnicity, and level of education were assessed via questionnaire in migraine participants (both samples) and controls.

Antidepressant medications used to treat depression and/or prevent migraine attacks—Given that FSD is a common side effect of antidepressant medications, information about use of such agents was collected from participants using the “brown bag” method in which participants were given a bag to bring all of their current medications to the research center for staff to record the prescription and over-the-counter items.

Analytic Approach

Analyses were conducted using IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp., 2011, Armonk, NY: <http://www.spss.com>). Descriptive statistics (mean and standard deviation) were calculated for all continuous variables. Categorical variables were represented using counts and proportions (%). Independent *t*-tests compared the FSFI-total and 6 separate domain scores of migraine participants and controls, with a Bonferroni-corrected significance level of $p=.007 (.05/7)$. Chi-square compared proportions of participants with FSD in the migraine and control groups, using $\alpha=.05$. In the larger sample of migraine participants, three separate logistic regression models evaluated whether three indices of migraine severity (attack frequency, intensity, and duration) were associated with

odds of FSD. Each of the models included age, BMI, depression and anxiety as covariates. As depression and anxiety are often correlated, models were run first with each covariate separately and then with both covariates included. Given that the tests produced similar findings, only results of models with both covariates included are reported. Similarly, because models substituting waist circumference for BMI produced comparable findings, only results of models with BMI are reported. Since multiple ($n=3$) tests were conducted, significance level to evaluate associations of attack frequency, intensity, and duration with odds of FSD was corrected using the Bonferroni procedure ($.05/3 = p<.017$). All tests of statistical significance were two-tailed. This study involved a secondary analysis of baseline data collected as part of an ongoing randomized controlled trial. For the randomized controlled trial, a sample of 140 participants was estimated to adequately power comparison of changes in monthly headache frequency between the behavioral weight loss intervention and migraine education control arms.

RESULTS

Participants: Migraine ($n=37$) and matched control ($n=37$) groups

Characteristics of participants in the migraine and control groups are presented in Table 1. Participants in both groups on average were of similar age (37.3 ± 7.2 years) and had severe obesity ($BMI=42.4 \pm 3.8$ kg/m²; range=35–49.9) as per design. Additionally, there were no significant differences between the groups in race/ethnicity, education level, and marital status. Participants with migraine on average had 5.7 ± 3.3 headache attacks across 8.2 ± 5.0 days that produced moderate pain intensity (6.1 ± 1.5 on 0–10 scale) and lasted an average of 15.6 ± 7.0 hours.

Differences in sexual function and dysfunction between migraine and matched control groups

Participants in the migraine and control groups had similar FSFI-total scores (24.5 ± 7.2 vs. 25.5 ± 4.6 , $p=.46$). Figure 1 shows that average FSFI scores for each of the 6 domains were similar between participants in the migraine and control groups ($ps>.05$). A similar proportion of participants in the migraine and control groups had FSFI scores that fell at or below the 26.55 cutoff indicating FSD (56.8% vs. 54.1%, $p=.82$).

Participants: Women with migraine and overweight/obesity ($n=105$)

Characteristics of the larger sample of migraine participants overall and by FSD classification (for descriptive purposes) are presented in Table 2. For all participants, the average age was 38 years. A similar percentage (17%) of participants reported racial minority group status and Hispanic or Latino ethnicity. More than half (56%) of participants had at least a 4-year college degree and nearly three-quarters (73.3%) were married or living with their significant other. On average, participants had severe obesity based on BMI ($BMI=35$) and waist circumference (range=70.3–169.5 cm). Participants recorded an average of 5 headaches over 8 days that produced moderate pain intensity and lasted 18 hours. Of the 105 participants, 49 (46.7%) had FSFI-total scores that fell at or below the 26.55 cutoff indicating FSD (see Figure 2 for distribution of FSFI-total scores and FSD classification).

Associations of migraine severity indices with odds of having FSD

Logistic regression analyses indicated that average number of migraine headache days ($p=.31$), maximum pain intensity ($p=.92$), and attack duration ($p=.35$) were not associated with odds of having FSD. The only variable that was associated with odds of FSD was anxiety. More severe anxiety symptoms were independently associated with higher odds of FSD in all 3 models: migraine headache days (OR=1.16 [95% CI: 1.03–1.29], $p=.012$), maximum pain intensity (OR=1.13 [95% CI: 1.03–1.28], $p=.016$), and attack duration (OR=1.15 [95% CI: 1.03–1.29], $p=.013$).

DISCUSSION

This study has two main findings. The first is that rates of FSD were similar in reproductive-aged women with migraine and obesity and age- and BMI-matched controls without migraine. This finding suggests that migraine is not associated with an increased risk of FSD among reproductive-aged women who have migraine and obesity. While previous research suggests that migraine and obesity are related^{19, 20} and migraine and obesity are each associated with increased risk of FSD^{8, 10, 12, 21, 22, 24}, the current study is the first to attempt to disentangle the relationships of these conditions with FSD. Obesity may contribute directly to FSD via lower levels of sexual desire³⁷ or through related biological (low testosterone)³⁸ and psychological (body dissatisfaction, depression, and low energy/fatigue^{39–42}) factors that impact sexual desire and function.^{43–47} Although we did not find that migraine was related to FSD in women with comorbid obesity, it is possible that this relationship could exist in women with normal weight. Thus, with the caveat that our study did not include normal-weight women with migraine, our findings coupled with increasing obesity rates in women¹⁸ support that the role of obesity and weight status should be considered in both migraine research and practice when evaluating contributors to sexual dysfunction and related health parameters.

The second main finding is that in the larger sample of women with migraine and overweight or obesity, approximately half (47%) of participants had FSD, and higher attack frequency, pain intensity, and attack duration did not contribute to increased risk of FSD. This finding is consistent with those from Eraslan and colleagues who found that MIDAS score nor attack frequency and severity were associated with FSD in 50 Turkish women with migraine.¹⁰ Another study found that attack frequency, but not pain intensity or attack duration, was associated with FSD, although potential confounders were not included in analyses.⁸ Taken together, findings from the current and previous investigations suggest that greater migraine severity does not contribute to increased risk of FSD or worse sexual function. However, given that all studies assessed sexual activity/functioning retrospectively, additional research that involves ecological momentary assessment (EMA) of both sexual activity/functioning and indices of migraine severity on a daily basis among women with migraine in their natural environment would help to better clarify these relationships.

Interestingly, the rate of FSD reported in the current sample is considerably lower compared to the rates (68%–90%) reported in the studies by previous investigators that administered the FSFI measure in samples with migraine and similar mean age.^{8, 10, 12} While reasons for the discrepancy in rates are not entirely clear, it is possible that past studies included women

who were not sexually active which artificially lowered FSFI-total scores and resulted in overestimation of FSD.³⁰ The present study is also the first to examine frequency of FSD in American adult women with migraine; thus potential differences in cultural attitudes and behaviors related to sexual activity could potentially account for the differences in FSD estimates between the current and previous studies conducted in countries of Europe and the Middle East.

Consistent with previous research showing that more severe psychological symptoms are associated with worse sexual function in women with migraine^{10, 32}, we found that more severe anxiety symptoms were associated with approximately 15% increase in odds of FSD. However, in contrast to the previous studies, we found that anxiety symptoms, and not depressive symptoms, were related to increased odds of FSD. Reasons for this difference are unclear but might be potentially explained by differences in measurement of depression and anxiety symptoms. Additionally, although the weight status of participants in the previous studies was not reported, the current sample was limited to women with overweight and obesity who are at increased risk for more severe anxiety symptoms compared to those of normal weight.⁴⁶ These findings may be explained by the negative impact of mood disturbance on brain centers associated with sexual drive, arousal, and pleasure.⁴⁷ Further, antidepressant medications also used to treat anxiety symptoms can limit sexual desire, sensation, and ability to achieve and maintain orgasm.^{48, 49} Given the low antidepressant medication usage rates in the current study and consequent inability to reliably determine the potential effects of these agents on FSD in women with migraine, future studies focused on this aim are warranted.

This study is not without limitations. Sexual distress was not measured. Sexual distress, defined as negative feelings about sexuality or sexual activities, is considered an important criterion in diagnosis of some sexual function impairments.^{1, 2} While we did collect information about marital status, we did not inquire about sexual orientation, specific relationship characteristics (e.g., duration of union), menopausal status (although average age for menopause in U.S. women exceeds the maximum age of participants in the current study), and number of children in the home, all of which may affect type and frequency of sexual behaviors. As noted above, sexual functioning and headache activity were not measured simultaneously, thus negating ability to determine acute impact of headaches on sexual function. The control sample was historical in nature and unrelated to the Women's Health and Migraine (WHAM) trial. As such, there could be important unmeasured differences between women seeking behavioral weight loss treatment versus those seeking bariatric surgery. Further, absence of migraine in controls was determined via self-report and not confirmed via neurological examination. Our sample was limited to women aged 50 years and younger. Additional research is needed to determine whether findings vary by factors such as menopausal status. Moreover, there is minimal knowledge of associations between migraine and sexual function in men. Given that this study involved a secondary analysis of a highly selected group of women with migraine with overweight/obesity seeking weight loss in an ongoing clinical trial, our findings should be replicated in wider populations of women with migraine and of normal-weight and overweight/obese status. Finally, future research utilizing longitudinal designs is needed to further clarify

relationships of migraine and obesity with sexual function and whether sexual function improves when headaches are improved and/or weight loss occurs.

CONCLUSIONS

This study showed similar rates of FSD in women with obesity and migraine and a matched sample of women with obesity who were free of migraine. Additionally, in a larger sample of women with overweight/obesity, greater anxiety, but not migraine severity, was associated with increased risk of FSD. Findings suggest that migraine and the severity of this disease are not associated with FSD. Future longitudinal studies that include wider populations of women migraineurs of variable weight status, employ prospective measures of sexual function, and can evaluate the effects of weight change on sexual function are needed to elucidate relationships of obesity, migraine and FSD.

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Abbreviations

FSD Female Sexual Dysfunction; Hypoactive Sexual Desire Disorder

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Figure 1.

Comparison of FSFI individual domain scores in participants with migraine and obesity and age- and BMI-matched migraine-free controls

Figure 2.

Distribution of FSFI total scores and FSD classification in women with migraine and overweight/obesity.

Note. FSFI-total score range 2–36. Participants' mean FSFI score was 25.3 ± 7.6 . FSD was defined using the validated FSFI total score cutoff of 26.55⁽¹⁵⁾. Darker gray shading includes scores in FSD range.

Table 1
 Characteristics of Women with Migraine and Obesity and Age- and BMI-Matched Migraine-Free Controls

	Migraine Participants (n=37)	Control Participants (n=37)	<i>p</i>
Age, mean ($\pm$ SD), yrs	37.0 (7.4)	37.6 (7.1)	.73
Race, n (%)			.17
White	29 (78.4)	28 (75.7)	
African American	7 (18.9)	4 (10.8)	
Other	1 (2.7)	5 (13.5)	
Ethnicity, n (%)			.45
Non-Hispanic	3 (8.1)	5 (13.5)	
Hispanic	34 (91.9)	32 (86.5)	
Education, n (%)			.64
< 4 year college/university degree	18 (48.6)	16 (43.2)	
4 year college/university degree	19 (51.4)	21 (56.8)	
Marital status, n (%)			.16
Married	19 (51.4)	24 (64.9)	
Not married (living with significant other)	7 (18.9)	7 (18.9)	
Never married	7 (18.9)	1 (2.7)	
Separated or divorced	3 (8.1)	5 (13.5)	
Other	1 (2.7)	1 (2.7)	
Body mass index, mean ($\pm$ SD), kg/m ²	41.9 (4.1)	42.9 (3.6)	.27

Characteristics of Participants with Migraine and Obesity Overall and by Female Sexual Dysfunction (FSD) Classification

Table 2

	All Participants (n=105)	Participants with FSD (n=49)	Participants without FSD (n=56)
Demographic characteristics			
Age, mean ($\pm$ SD), yrs	38.2 (7.8)	39.0 (7.9)	37.5 (7.8)
Race, n (%)			
White	87 (82.9)	41 (83.7)	46 (82.1)
African American	9 (8.6)	5 (10.2)	4 (7.1)
Other	5 (4.8)	2 (4.1)	2 (3.6)
Mixed	4 (3.8)	1 (2.0)	4 (7.1)
Ethnicity, n (%)			
Non-Hispanic	87 (82.9)	41 (83.7)	46 (72.1)
Hispanic	18 (17.1)	8 (16.3)	10 (17.9)
Education, n (%)			
< 4 year college/university degree	46 (43.8)	23 (46.9)	23 (41.1)
4 year college/university degree	59 (56.2)	26 (53.1)	33 (58.9)
Marital status, n (%)			
Married	67 (63.8)	35 (71.4)	32 (57.1)
Not married (living with significant other)	10 (9.5)	3 (6.1)	7 (12.5)
Never married	18 (17.1)	8 (16.3)	10 (17.9)
Separated or divorced	9 (8.6)	3 (6.1)	6 (10.7)
Other	1 (1.0)	0 (0.0)	1 (1.8)
Anthropometric characteristics			
Body mass index (BMI), mean ($\pm$ SD), kg/m ²	34.8 (6.4)	35.7 (6.4)	34.1 (6.4)
Overweight (BMI 25<30), n (%)	26 (24.8)	10 (20.4)	16 (28.6)
Class I obesity (BMI 30<35), n (%)	33 (31.4)	14 (28.6)	19 (33.9)
Class II obesity (BMI 35<40), n (%)	23 (21.9)	12 (24.5)	11 (19.6)
Class III obesity (BMI 40), n (%)	23 (21.9)	13 (26.5)	10 (17.9)
Waist circumference, mean ($\pm$ SD) cm	103.7 (16.4)	104.4 (14.4)	103.2 (18.1)
Migraine headache characteristics			

	All Participants (n=105)	Participants with FSD (n=49)	Participants without FSD (n=56)
Headaches, mean ($\pm$ SD) number	5.3 (2.9)	5.0 (2.4)	5.7 (3.2)
Headache days, mean ($\pm$ SD) number	8.0 (4.3)	7.5 (4.2)	8.5 (4.3)
Maximum pain intensity, mean ($\pm$ SD), 0–10 scale	5.9 (1.4)	5.9 (1.3)	5.9 (1.5)
Headache duration, mean ($\pm$ SD) hours	18.3 (9.7)	17.3 (9.1)	19.3 (10.2)
Psychological characteristics			
Depression, mean ($\pm$ SD) CES-D score	14.4 (4.8)	15.0 (4.8)	13.9 (4.8)
Anxiety, mean ($\pm$ SD) GAD-7 score	6.1 (4.6)	7.2 (4.9)	5.1 (4.1)
Use of antidepressant medications, n (%)	24 (22.9)	15 (30.6)	9 (16.1)