INTRODUCTION

Sexual health and functions constitute a significant aspect of individuals’ quality of life, while the factors influencing this domain are highly intricate. Women’s sexual functions are shaped by the complex interplay of physiological, psychological, and social factors. Among these factors are body image, self-esteem, stress levels, and psychological state. Ruminative thoughts (RT), which play a role in the pathogenesis of psychological disorders like anxiety and depression and are believed to negatively impact sexual health, also have a noteworthy association with sexual health. The relationship between RT and sexual health emerges as an important research area, particularly in the context of obesity, where this association remains relatively underexplored.

RT refer to specific thought that can have an impact on mental health and functionality. These thoughts often recur, are frequently uncontrollable, and
typically focus on negative or worrisome content.\textsuperscript{6,9} For instance, situations where an individual constantly dwells on past mistakes or future negatives can serve as examples of RT. In the literature, these thoughts are commonly referred to as rumination or mental anxiety. Rumination signifies the cyclical contemplation of a specific issue or problem, while mental anxiety may reflect a more general and persistent state of anxiety.\textsuperscript{5,10}

On the other hand, obesity, which has emerged as a global public health issue today, is associated with numerous biological and psychological problems.\textsuperscript{11,12} Obesity often has negative effects on individuals’ body image and self-esteem. Moreover, obesity has been linked to psychological stress, anxiety, and depression, factors that can also negatively impact sexual functions.\textsuperscript{13} The fight against obesity still suggests that the most effective approach is the regulation of dietary habits and incorporating exercise, which, in addition to its direct effects on preventing weight gain and reducing (Body Mass Index) BMI, indirectly implies potential positive impacts (such as addressing ruminative thoughts disorders, sexual functions, etc.).\textsuperscript{14} This study aimed to investigate the potential relationship between RT and women’s sexual functions. Specifically, the focus was on examining the differences in this relationship between obese and non-obese women, with the anticipation that it will provide valuable insights into the field of sexual health.

METHODS

This case-control study included a total of 171 women, as per the inclusion criteria. These criteria encompassed women diagnosed by a psychiatrist, according to DSM-5 criteria had not previously been diagnosed with the patient and/or their partner with organic and/or psychiatric diseases that could cause sexual dysfunction and/or being under treatment, as well as pregnancy. Participants who did not meet the inclusion criteria were excluded from the research. Ethical Approval: This study has been approved by the Istanbul Medeniyet University Göztepe Training and Research Hospital Clinical Research Ethics Committee of the Ministry of Health (02.12.2020-0697). After ethics committee approval was obtained, people who applied to Department of Family Medicine at Istanbul Medeniyet University Göztepe Training and Research Hospital in 2021 were included in the study.

Out of the initial total, the number of women who did not meet the age criteria was 46, while the number of women aged 45 and under who had reached menopause was three. Consequently, a total of 122 women were included in the study (Fig.1).

Among the participants, 63 (51.6%) were in the normal BMI range (BMI <25), 21 (17.2%) were in the preobese (overweight) range (BMI ≥ 25, <30), and 38 (31.1%) were classified as obese (BMI > 30). The average BMI for women in the normal group was 21.67 ± 1.75 (min: 17.7- max: 24.9), while the average BMIs for women in the preobese and obese groups were 33.98 ± 7.36 (min: 25.5- max: 53).

Measurement Tools: Ruminative Thought Style Questionnaire: The Ruminative Thought Style (RTS) is a ruminative and uncontrollable form of thinking. The scale, developed by Brinker and Dozois, consists of 20 items and is measured using a seven-point Likert scale.\textsuperscript{15} The Turkish adaptation of the scale was carried out by Karatepe.\textsuperscript{16} There is no specific cutoff point for scoring the scale. An increase in the total score obtained from the scale indicates an increase in RTS. The Turkish reliability coefficient of the scale is calculated as 0.91. In our study, it was found to be 0.95.

Female Sexual Function Index: The Female Sexual Function Index (FSFI), a questionnaire consisting of 19 questions, was developed by Rosen and colleagues. Its Turkish validity and reliability were established by Aygin et al. This index is used by sexual health professionals to evaluate and comprehend women’s sexual function issues, and its primary purpose is to identify and guide treatment of sexual health-related problems by assessing various aspects of female sexual functions.\textsuperscript{17} The FSFI has six primary components: desire, arousal, lubrication, orgasm, satisfaction, and pain. Each component is evaluated with specific questions and a scoring system. By totaling the scores of these components, an overall score for sexual function can be calculated. Low scores may indicate potential issues with a woman’s sexual function, and this information can provide guidance for additional assessment and, if needed, intervention by sexual health specialists.
The FSFI score is categorized as good if >30, moderate if 23-29, and poor if <23. The Turkish reliability coefficient of the scale is 0.79, whereas in our study, it was calculated as 0.98.

Arizona Sexual Experiences Scale: The Arizona Sexual Experiences Scale (ASEX) is a self-report questionnaire developed to assess changes and disorders in sexual functioning. It comes in two separate forms for females and males, each consisting of five questions. Each question on the scale addresses sexual desire, psychological arousal, physiological arousal, capacity to reach orgasm, and post-orgasmic satisfaction. Each question is scored from one to six and the total score ranges from 5 to 30.

Individuals with a total score of 10 or below are considered to have a very low probability of having a sexual dysfunction based on psychiatric examination. A total score of 19 or higher, any item scored five or six, or three or more items scored four indicate sexual dysfunction and are highly associated with diagnosed sexual dysfunctions by clinicians. The Turkish version of the scale’s validity and reliability study was conducted by Soykan et al., and the reliability coefficient was reported as 0.88 and 0.92. In our study, the reliability coefficient was calculated as 0.87.

Statistical Analysis: Normality control of continuous variables was conducted using the Shapiro-Wilk test. In group comparisons where variables conformed to a normal distribution, the Independent Sample t-test was adopted, while the Mann Whitney U test was employed otherwise. Considering that age averages differed across the groups and could influence the outcome variable, we performed re-evaluation with the Analysis of Covariance. The multiple linear regression models were implemented to evaluate how the factors impact women’s sexual lives. The reliability of the scales was measured by Cronbach’s Alpha with a statistical significance level of 0.05 applied to all analyzes. The TIBCO Statistica® 13.5.0.17 program was used to analyze the data.

RESULTS

The average age of the women included in the study was observed to be higher in the preobese and obese groups, and this difference was statistically significant (p<0.05). Although higher Ruminative Thought Style scores were observed in the preobese and obese groups, no statistically significant difference was found (p>0.05) (Table-I).

The evaluation of women’s sexual life according to obesity is given in Table-II. In the initial comparison of the groups, it was observed that the FSFI score was lower in preobese and obese women, indicating that their sexual functions were comparatively diminished. Both groups could be categorized as having a moderate level of sexual function (FSFI 23-29).

However, even after age adjustment, no significant difference was found in terms of FSFI values between the groups (p> 0.05). A score above 10 on the ASEX test indicates potential sexual dysfunction, which was observed in both groups. However, women with a BMI in the preobese and obese range had significantly higher ASEX scores. Multiple regression models were used to study the factors that affect women’s sexual experiences. Table-III The findings reveal that being obese increases the ASEX score by 2.09 units. Age and rumination were not found to contribute to sexual dysfunction (p>0.05). For FSFI scores, obesity and increasing age were associated with a decrease, but no statistically significant difference was detected.

Table-I: Women’s Age and Ruminative Thinking Scores.

<table>
<thead>
<tr>
<th>Normal</th>
<th>Preobese+Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean±SD</td>
<td>Median (IQR)</td>
</tr>
<tr>
<td>Age</td>
<td>32.52±5.35</td>
</tr>
<tr>
<td>Ruminative Thought Style Questionnaire (RTSQ)</td>
<td>87.81±28.17</td>
</tr>
</tbody>
</table>

Table-II: Assessing the impact of obesity on women’s sexual activity.

<table>
<thead>
<tr>
<th>Normal</th>
<th>Preobese+Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean±SD</td>
<td>Median (IQR)</td>
</tr>
<tr>
<td>FSFI</td>
<td>24.83±8.52</td>
</tr>
<tr>
<td>ASEX</td>
<td>14.21±4.30</td>
</tr>
</tbody>
</table>

RT, on the other hand, was observed to contribute to a decrease in sexual function, and an increase of one unit in the RTSQ score led to a decrease of 0.06 units in the FSFI score (p<0.05). The resulting regression models were found to be statistically significant, explaining 6.2% and 6.8% of the variation in sexual experiences based on the variables in the model.

**DISCUSSION**

RT (Repetitive Thinking) is considered as a transdiagnostic process involved in the development and perpetuation of emotional disorders that adversely affect sexual function, although the exact mechanism of its impact remains not fully elucidated. In a study conducted by Peixoto and colleagues, which aimed to examine the effect of negative repetitive thinking disorders on sexual functions in a total of 424 participants, including 270 women aged between 18 and 72, it is shown that women are more predisposed to RT and have greater difficulty disengaging from these types of thought processes. Our study was conducted exclusively with women that also found this score to be high. In studies where Nappi and Heidari at al., assessed sexual behaviors during menopause, negative changes in sexual behavior patterns of women during the menopausal period were evaluated; therefore, female participants in the climacteric and menopausal period were not included in this study.

To comprehend the impact of RT on obese and non-obese women, which in the climacteric and menopausal period have not been included in this study, and it is considered to be the first study of its kind found in the literature. Although higher RTS scores were observed in the preobese and obese groups, no statistically significant difference was found when compared to non-obese individuals.

Age has a potent impact on relationship quality and sexual functioning. The psychological influence of aging after midlife is a significant subject in terms of sexuality, relevant for both women and men. According to our study, women’s sexual experiences are influenced by obesity, but the effect of obesity on sexual experiences is not influenced by age. However, unlike obesity, rumination does not share a similar interaction with age; instead, it is observed to have negative effects on sexual health.

**CONCLUSION**

This study demonstrates that RT patterns could be a significant factor affecting the sexual health of obese women. In the future, further research in this field could help us in understanding sexual health issues related to obesity and developing effective interventions.

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**Conflicts of interest:** None.

**Grant Support & Financial Disclosures:** None.

**REFERENCES**


Table-III: Factors that affect women’s sexual life.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>ASEX B (95% C.I)</th>
<th>t</th>
<th>p</th>
<th>FSFI B (95% C.I)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>8.97 (2.52-15.42)</td>
<td>2.75</td>
<td>0.007</td>
<td>39.09 (27.7-50.47)</td>
<td>6.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Obesity</td>
<td>2.09 (0.11-4.06)</td>
<td>2.09</td>
<td>0.038</td>
<td>-2.16 (-5.65-1.32)</td>
<td>-1.23</td>
<td>0.221</td>
</tr>
<tr>
<td>Age</td>
<td>0.09 (-0.07-0.26)</td>
<td>1.14</td>
<td>0.255</td>
<td>-0.28 (-0.57-0.01)</td>
<td>-1.93</td>
<td>0.056</td>
</tr>
<tr>
<td>RTSQ</td>
<td>0.02 (-0.01-0.06)</td>
<td>1.54</td>
<td>0.126</td>
<td>-0.06 (-0.12--0.01)</td>
<td>-2.06</td>
<td>0.042</td>
</tr>
</tbody>
</table>

R²: 0.062, F:3.674, p:0.014

R²: 0.068, F:3.926, p:0.010

p: Multiple Linear Regression, R²: Coefficient of determination, FSFI: Female Sexual Function Index, ASEX: Arizona Sexual Experiences Scale, RTSQ: Ruminative Thought Style Questionnaire


**Author’s Contribution:**

HG: Conceived, designed, editing.
HTK: Did data collection.
AAO: Did statistical analysis.
IB: Did manuscript writing, review, and final approval of manuscript and responsible for the accuracy of the work.