

Is There a Significant Association Between Body Image and Psychological Health in Moroccan Postmenopausal Women? A Cross-Sectional Study



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Abstract:

Background: Menopause and its consequences, sometimes complex, can generate discomfort in well-being and consequently affect the quality of women's lives.

Objective: The present study was carried out to examine the quality of life of menopausal women in the North-East of Morocco. The objective of this study was to investigate the impact of anthropometric changes in corpulence, weight gain, and abdominal obesity on the self-esteem of menopausal women and to explore how these changes may increase the risk of psychological problems.

Methods: A cross-sectional study was conducted with 199 women aged 40-59 years. Participants completed a questionnaire about their lifestyle, feelings, and psychological experiences alongside undergoing anthropometric measurements.

Results: The study found that over 70% of women in this region experienced weight gain, increased body fat, and abdominal obesity. However, despite these physical changes, the analysis revealed that body image and self-esteem were not significantly negatively impacted, and women did not report notable psychological distress related to these changes.

Conclusion: The findings suggest that despite physical changes such as weight gain and abdominal obesity, menopausal women may not experience significant negative effects on their self-esteem or body image.

Keywords: Menopause, Anthropometric changes, Psychological health, Body image, Quality of women's lives, Libido, Post-traumatic stress syndrome.

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1. INTRODUCTION

1.1. Body Image and Its Definition

Body image is defined as "Body image refers to the representation of the body both conscious and unconscious including not only physiological awareness, but also the concept of libido and the social significance attributed to the body" [1]. It is well known that body

image changes throughout life and is influenced by various factors such as libidinal development and biological and psychological factors [2]. Any physical "damage" to the body, which becomes more pronounced with age, can have psychological consequences such as anxiety, depressive disorders, post-traumatic stress syndrome, etc [3].

1.2. Hormonal Changes and Their Impact During Menopause

During menopause, women experience significant hormonal changes that can affect their body image. The secretion of hormones decreases, and fat tends to increase above the navel if there is no hormone replacement therapy. The most disturbing factor in body changes for menopausal women is weight gain. Studies [4-6] have examined whether weight gain in the fifties is simply a function of age or whether it is associated with hormonal changes secondary to menopause. They concluded that the average weight gain of about 0.5 kg per year is due to age rather than menopause itself. It should also be noted that race and physical activity can have profound effects on both obesity and body fat distribution [7-9].

1.3. Weight Gain and Its Psychological Effects

Increasing abdominal obesity has a negative effect on psychological health, deeply influencing the quality of life [10]. On average, menopausal women can easily gain 0.7 kg per year, regardless of their initial body size or race/ethnicity [5]. Sleep disorders also affect weight gain in menopausal women [11-14]. A woman in her 40s who suffers from obesity reports more frequent and unpleasant symptoms, such as hot flashes and sexual dysfunction, than those with a normal body mass index (BMI) [15, 16].

1.4. Metabolic Risks and Cardiovascular Health

Several studies [4, 6, 8, 9] have reported that obesity is a risk factor for developing metabolic disorders such as metabolic syndrome, diabetes mellitus, cardiovascular diseases, hypothyroidism, stroke, inflammatory diseases, and gynecologic cancer. Consequently, obesity can be associated with a higher risk of death. The waist/hip circumference ratio is an important predictor of metabolic changes, regardless of the total mass of adipose tissue estimated by BMI or ideal weight [17-20]. The ratio of waist circumference to hip circumference greater than 0.8 is frequently used [21]. In addition, other studies indicate that the ratio of abdominal circumference/hip circumference is more strongly associated with the risk of cardiovascular disease in women than in men [19]. It has also been suggested that BMI determines central obesity in postmenopausal women [9]. Abdominal diameter represents both subcutaneous and visceral fat and correlates well with the risk of cardiovascular disease [22]. The WHR is another indicator of visceral fat accumulation that can be quantified by a scanner [23].

1.5. Body Image Dissatisfaction and its Psychological Implications

In addition to health implications, higher BMI is associated with greater body dissatisfaction [24, 25] and dissatisfaction with body weight [26]. Anthropometric measurements, such as height and weight, are cost-effective and simple ways to gather data on a large scale. BMI has historically been used in epidemiological studies due to its high reproducibility and validity [27]. However, BMI provides only an overall indicator of body size and

does not distinguish between fat mass and lean mass [28, 29]. Furthermore, it does not account for the distribution of adipose tissue in the body. Adipose tissue is distributed in two ways: android (central) obesity, where adipose tissue is mainly located in the upper body and abdomen, and gynoid obesity, where adipose tissue is stored mainly in the lower body, especially in the hips and thighs [30]. Android obesity is more closely associated with metabolic alterations than gynoid obesity [31].

1.6. Central Obesity, Menopause, and Mental Health

Waist and hip measurements are used to distinguish between the two types of obesity. Waist circumference is a better indicator of abdominal obesity than BMI, but it does not differentiate between subcutaneous and visceral adipose tissue. The WHR is also a useful indicator of abdominal obesity, while hip circumference is used to characterize gluteo-femoral obesity [32, 33]. It is important to note that metabolic syndrome and cardiovascular risk are more closely related to visceral adipose tissue (intraperitoneal) than to subcutaneous fat [34]. Adiposity size, number, and gene expression involved in adipogenesis and lipogenesis differ depending on the location of the adipose tissue (Fig. 1). Peripheral subcutaneous fat (gynoid) has a mechanical and thermal insulation role and serves as a specific energy reserve for pregnancy. Unfortunately, this type of fat gradually disappears during menopause, contributing to the accumulation of abdominal fat.

1.7. The Psychological Impact of Body Image Changes During Menopause

Body image, in particular, has been shown to influence mental health, with changes in physical appearance during menopause, such as weight gain, changes in skin texture, and decreased muscle mass, contributing to concerns about self-esteem and body dissatisfaction. Globally, studies have demonstrated that negative body image during menopause can lead to various psychological issues such as anxiety, depression, and even a decrease in overall life satisfaction [35]. However, the vast majority of research has focused on Western populations, with less attention given to how cultural, social, and regional factors might affect women's perceptions of body image during this life stage.

1.8. The Lack of Research on Body Image and Mental Health in Morocco

This gap is particularly evident in North African and Middle Eastern countries, where traditional beauty standards and social expectations may uniquely influence women's experiences of menopause. In Morocco, the issue of body image and its relationship with psychological health has not been extensively studied, particularly among menopausal women [36, 37]. While there is a growing body of research on women's health in Morocco, very few studies have focused on the intersection of body image, aging, and mental health in this specific demographic [38-40]. Moreover, the socio-cultural context in Morocco, including the influence of family, community,

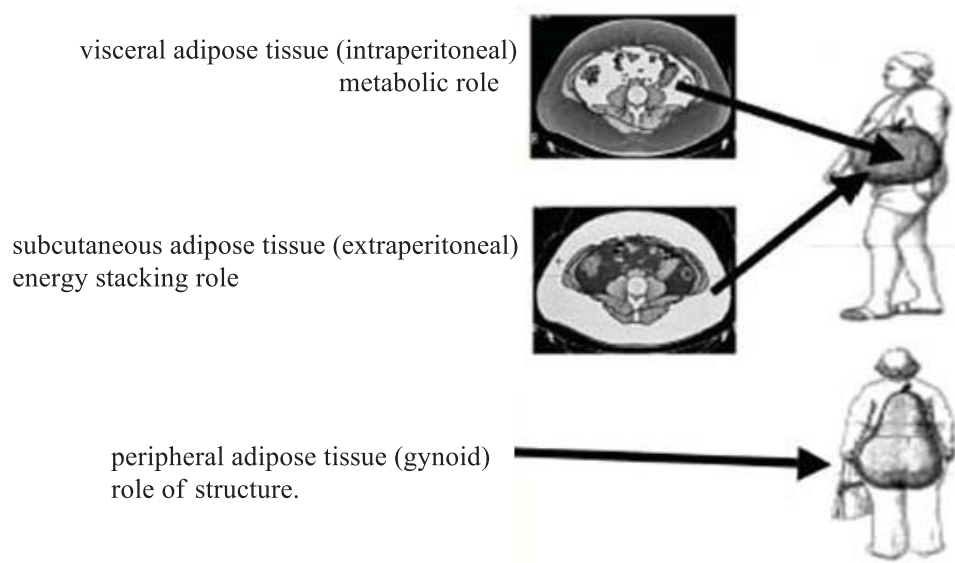


Fig. (1). Distribution of fatty tissue in the body.

and cultural norms, might play a significant role in shaping how menopausal women perceive their bodies and how these perceptions affect their psychological health. This context underscores the need for a deeper understanding of body image during menopause in Morocco, especially given that cultural factors may differ significantly from those in Western populations [41]. In this region of North-Eastern Morocco, excluding our study on menopause [42], no research has been conducted to date on the influence of body image on self-esteem in postmenopausal women.

1.9. Significance of This Study

This gap in the literature presents a significant opportunity for further investigation. Our study addresses this gap by exploring the relationship between body image, self-esteem, and psychological well-being among menopausal women in Morocco. Given the limited research in this area, this study is crucial for understanding the unique challenges faced by Moroccan women during menopause. It provides valuable insights that could inform local healthcare strategies and interventions aimed at improving mental health and quality of life during this life stage. Furthermore, it offers a culturally relevant perspective that can contribute to the broader global understanding of menopausal health, particularly in North African and Middle Eastern regions.

1.10. Objectives

The main objective of this study is to investigate the relationship between body image, self-esteem, and psychological well-being in postmenopausal women in north eastern Morocco. Specifically, this study aims to:

- [1] Examine the impact of anthropometric changes (such as weight gain, abdominal obesity, and increased body fat)

on the body image and self-esteem of postmenopausal women.

- [2] Assess the psychological health outcomes, including anxiety, depression, and overall mental well-being, in relation to body image in this demographic.
- [3] Explore potential socio-cultural factors that may influence body image perceptions and their impact on psychological health during menopause.

1.11. Prespecified Hypotheses

- [1] Hypothesis 1: Anthropometric changes (such as weight gain and abdominal obesity) will be associated with poorer body image and lower self-esteem in postmenopausal women.
- [2] Hypothesis 2: There will be a significant negative correlation between body image dissatisfaction and psychological health (including increased anxiety and depression) in postmenopausal women.
- [3] Hypothesis 3: Socio-cultural factors, such as community and family expectations, will moderate the relationship between body image and psychological health in postmenopausal women in North-Eastern Morocco.

2. MATERIALS AND METHODS

2.1. Study Design and Type of Study

This study used a cross-sectional design, where data were collected over a period of more than one year. Although the data collection spanned over time, each participant was assessed at a single point in time, which is characteristic of cross-sectional studies. The extended data collection period allowed for a broader and more diverse sample, ensuring that we could capture variations in body image perceptions across different seasons or months, as well as providing ample time for recruitment.

This design is still considered cross-sectional, as each participant was assessed at a single point in time. The study was conducted in collaboration with the Ministry of Health's division in the Nador region of North-East Morocco, where a population of more than 591507 inhabitants resides [43].

2.2. Sample Size and Population

The participants in this cross-sectional study were selected using simple random sampling, a method chosen to ensure a representative sample of women from semi-rural and urban populations. The sample was drawn at a single point in time from various health centers, hospitals, and community associations within the Nador region, ensuring a diverse range of socio-economic backgrounds and experiences were represented. Data were collected *via* an offline survey to accommodate participants from different regions and increase accessibility. The study involved a total of 199 menopausal women aged between 40 and 59 years. These participants were selected from various areas, such as health centers, hospitals, associations, and mosques within the Nador region, representing different economic and social backgrounds. The study exclusively involved female participants, as it focused on the menopausal experience in women. The women were informed about the study's purpose and objectives, and after providing their consent, they were assigned a numerical code for confidentiality. This sample size is adequate to provide a robust analysis of the relationship between body image and psychological health in the target population.

2.3. Inclusion and Exclusion Criteria

Inclusion criteria for participation in this study were: (1) women aged 40–60 years, (2) who have experienced menopause or are currently in the perimenopausal stage, and (3) who are living in the Nador region. Exclusion criteria were: (1) women with a diagnosed psychiatric disorder that could interfere with body image perception, (2) individuals undergoing hormone therapy or treatment for body image-related conditions, and (3) women who did not provide informed consent.

2.4. Instruments

For measuring psychological health, body image, and lifestyle factors, we used several established instruments. The Body Image Concern Inventory (BICI) was used to assess body image perception, which measures various aspects such as satisfaction with body shape, weight, and appearance. For psychological health, we used the Generalized Anxiety Disorder Scale (GAD-7), which is widely recognized for its validity in assessing anxiety symptoms. Lifestyle factors were evaluated using the Lifestyle Assessment Questionnaire (LAQ), which includes questions on physical activity, diet, and sleep patterns. All instruments have been validated in populations similar to the one in this study. Questionnaire and Anthropometric Measurements: The participants completed a questionnaire designed to assess their lifestyle, feelings, and psychological experiences. The survey also included

anthropometric measurements to determine physical changes related to menopause, such as weight, height, waist circumference, and waist-to-hip ratio.

2.5. Variables

The independent variable in this study is body image, which was measured using the Body Image Concern Inventory (BICI). Psychological health outcomes, such as anxiety and depression, were assessed using the Generalized Anxiety Disorder Scale (GAD-7), which were the key dependent variables in this study. This tool assesses various aspects of body image, such as satisfaction with body shape, weight, and appearance. The BICI provides a comprehensive score reflecting the participants' overall body image perception, which was used to explore its impact on psychological health outcomes.

2.6. Statistical Analysis

Descriptive and inferential statistical methods were used to examine the association between body image and psychological health outcomes. The association was tested using Pearson's correlation and independent t-tests to assess the impact of body image on mental health outcomes. While multivariate analysis is commonly used to control for confounding variables, it was not applied in this study due to the relatively small sample size. Furthermore, the focus of this analysis was to explore the direct relationship between body image and psychological health. Future studies with larger sample sizes will incorporate multivariate techniques to control for additional confounders. Data were analyzed using the SPSS statistical program. Preliminary analysis was conducted using HOMALS software [44], which applies the alternating least squares technique for homogeneity analysis. To assess attitudes toward body appearance, Cash's theoretical model was applied [45]. Additionally, elements of Schilder's theory [1] of the construction of body image were integrated into the analysis to examine how biological, psychological, and social factors shape women's body image perceptions.

3. RESULTS

3.1. Anthropometric Measurements and Bodily Changes in Menopausal Women

A total of 199 menopausal women were surveyed. The mean age of the participants was (54.38 ± 5.25) years, and the average age at menopause was (49.57 ± 3.48) years. 76.4% of the participants were married. 8.4% were divorced, 10.0% were widowed, 4.4% were single, and 0.8% were remarried. All participants were active at home and professionally and lived in socio-economic conditions ranging from medium to modest. During our conversations with interviewed women, we aimed to understand which aspects of body image they prioritize and how it impacts their daily lives. The women immediately mentioned two aspects: appearance and health.

Table 1 presents the main measurements used to determine the importance of adiposity, including BMI, WC,

Table 1. Body mass index, waist circumference, and waist-to-hip ratio measurements in menopausal women.

Measurement of BMI		
N Percentage		
BMI normal weight (18.5-24.99kg/m2)	23	11.6%
BMI overweight (25.00-29.99kg/m2)	105	52.8%
Obesity ≥ 30kg/m2	71	35.6%
Total mean BMI	n = 199 29.01±3.91	
Measurement of BMI perceived		
N Percentage		
BMI underweight (16.00- 18.49kg/m2)	25	12.7%
BMI normal weight (18.5- 24.99kg/m2)	101	51%
BMI overweight (25.00-29.99kg/m2)	66	33.3%
Obesity ≥ 30kg/m2	6	3%
Total mean BMI perceived	n = 199 22.44±3.34	
Measurement of waist circumference		
N Percentage		
WC < 80cm (norme)	3	1.5%
WC between 80-88cm (overweight)	20	10.1%
WC > 88cm (abdominal obesity)	176	88.4%
Total mean WC n = 199 101.08± 9.05		
Measurement of waist-hip ratio		
N Percentage		
WHR under 0.80 (low)	12	6%
WHR between 0.81- 0.85 (Moderate)	28	14.1%
WHR >0.85 (android obesity)	159	79.9%
Total mean WHR	n = 199 0.91± 7.03	

and WHR of the participants. The BMI showed that 52.8% were overweight and 35.6% were obese, while only 11.6% had a normal weight with a score of (29.01 \pm 3.91). Perceived BMI showed contradictory results compared to the real BMI measurements, with 51% of women perceiving themselves as being of normal weight and 12.7% perceiving themselves as underweight with a score of (22.44 \pm 3.34). The WC showed that 88.4% of women in the sample suffered from abdominal obesity, and only 1.5% were in the normal weight category with a score of (101.08 \pm 9.5). The WHR also showed a high android obesity with 79.9%, while only 14.1% had a moderate one.

3.2. The Psychological State of Menopausal Women and Anthropometric Measurements

In Fig. (2), we present the results of the HOMALS analysis, which shows that the participants in this study are divided into two groups. The first group has a positive psychological state: the first group does not feel depressed, maintains their feminine identity, accepts menopause, and lives well during this period. The second one has a negative psychological state: they resist accepting their status as menopausal women, feel a loss of femininity, are depressed, have a negative body image, feel undesired, and experience difficulties during this period.

3.3. Association of Psychological States and Anthropometric Measurement of Menopausal Women

In Table 2, we present the data related to the association of psychological states and anthropometric mea-

surements of participants in this survey. There was no significant difference in BMI (p-value = 0.295) between satisfied and dissatisfied individuals in terms of normal weight (11%). In terms of overweight, 57.9% of satisfied women and 47.6% of not satisfied women have a BMI of over 25. In the case of obesity, 30.5% of satisfied women and 10.8% of not-satisfied women have a BMI of over 30. The mean WC is relatively the same in satisfied and dissatisfied women (89.5 cm and 87.4 cm, respectively). In the case of WHR > 0.8 (android obesity), there is a small difference between satisfied and dissatisfied women, with 81.1% and 78.6%, respectively.

4. DISCUSSION

Before discussing our results, it is important to note that the population of the region where we conducted our study is relatively more conservative than other regions in Morocco, and the educational level of women is very low. Consequently, many women in this region may be unaware of the seriousness of obesity on their health. In this study, we sought to examine the perception of body image of a significant sample of women representative of the Nador population. In order to assess the differences in perception of body image and body dissatisfaction, Table 1 presents the different BMI categories. Among 199 menopausal women, more than half have a relatively high BMI (> 25 kg/m²), and around 36% are in the obese category. Regarding the perceived BMI, although we did not note any underweight women, more than 12% see themselves as under normal weight, and more than half consider themselves to be normal weight. This may be because, in this region, obese women consider themselves attractive

and sexier than thin women, and for them, it is a sign of better health. Only 3% of interviewed women consider themselves as being too fat. This disagrees with the fact that a higher BMI is more strongly related to body dissatisfaction in women [46, 47]. However, we can say that the expected relationship between body satisfaction and social self-esteem was found in this sample. Higher levels of body satisfaction were associated with higher levels of social self-esteem [48].

If the reference calculation to identify overweight or obesity is that of the BMI, the measurement of the WC is also to be taken into account. The WC is a simple indicator of excess abdominal fat in adults (abdominal obesity, synonyms: visceral or central). Excess abdominal fat is associated, regardless of BMI, with the development of metabolic and vascular complications of obesity [49, 50]. WC measurement is a good clinical indicator for

Table 2. The association of psychological states and anthropometric measurements of menopausal women.

-	Good Psychological State		Bad Psychological State		
	N	Percentage	N	Percentage	Chi-square
BMI normal weight (18.5-24.99kg/m2)	11	11.6%	12	11.7%	2.451; 2ddl P= 0.295ns
BMI overweight (25.00-29.99kg/m2)	55	57.9%	49	47.6%	
Obesity ≥30kg/m2	29	30.5%	42	40.8%	
WC < 80cm (norme)	0	0%	3	2.9%	2.824; 2ddl P= 0.244
WC between 80-88cm (overweight)	10	10.5%	10	9.7%	
WC > 88cm (abdominal obesity)	85	89.5%	90	87.4%	
WHR under 0.80 (low)	1	1.1%	11	10.7%	9.412; 2ddl P= 0.09
WHR between 0.81- 0.85 (moderate)	17	17.9%	11	10.7%	
WHR >0.85 (androide obesity)	77	81.1%	81	78.6%	

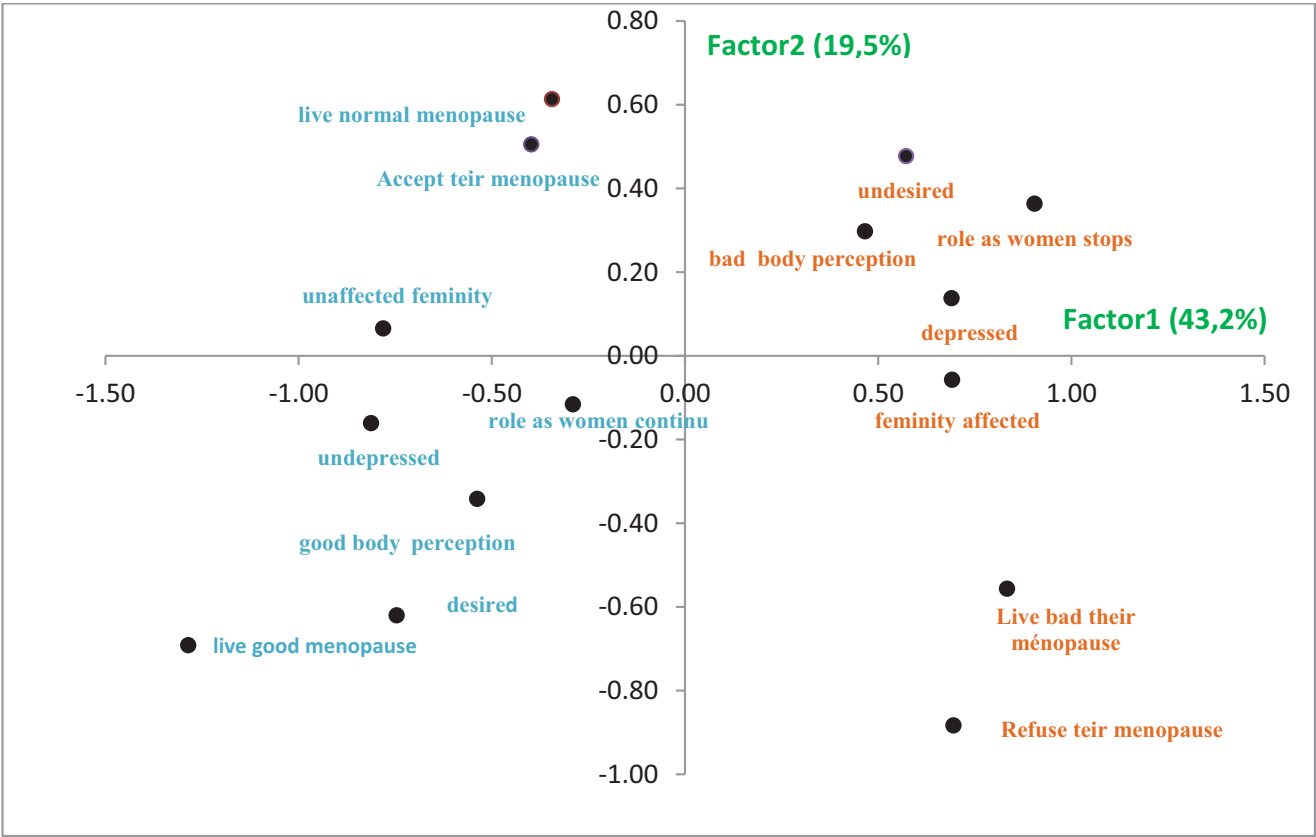


Fig. (2). HOMALS plot presenting the psychological state of menopausal women.

estimating abdominal adiposity and health risk [51]. Abdominal obesity is defined with specific values for WC according to ethnic group [52]. In Caucasians, abdominal obesity is defined as a WC ≥ 80 cm in women and ≥ 94 cm in men [10]. In our considered sample, more than 88% have a WC ≥ 88 cm. In some studies, it is anticipated that a WC > 86 cm is associated with an increased risk of depressive disorder [53]. However, in our study, we noticed that the majority of women interviewed were happy and satisfied with their weight and shape, considering they have a normal height according to their ages. The same remark can be made by analyzing the values of WHR. Almost 80% of women in the sample present android obesity. Only 6% have a low WHR. When WC and WHR are recorded, two messages can be revealed [32, 49]. First, WC is positively associated with the risk of death at all WHR sizes except for those with smaller hips. Second, among those who had a smaller WC, WHR size was negatively associated with the risk of death. In our sample, more than 80% of individuals would be identified as being at higher risk of death when considering both WC and WHR.

The results of HOMALS indicate that there are two groups of women in our sample. The first group has a good psychological state, feels feminine, and accepts menopause as a natural part of life. They play their role as women and live well during menopause. The second group, however, has a bad psychological state and refuses to accept menopause. They feel that their femininity is affected, and they have a negative body perception. As a result, they experience depression and feel undesired during menopause.

Despite these differences, our analysis of psychological states and anthropometric measurements (Table 2) found no significant association between them. Even if women are overweight or obese, their body image does not necessarily affect their well-being. Therefore, menopause is not just about physiological changes but also a period of confusion that leads menopausal women to a change in their psychological state, requiring an effort to adapt and find a new balance where psychopathological disorders are commonly frequent [54].

At least in this region of Morocco, our study shows that obese menopausal women who perceive themselves as normal weight may have a relatively high prevalence of depression. According to BMI measurements, over 40% of interviewed obese women are in a bad psychological state. Surprisingly, almost half of overweight women are in a good psychological state.

According to WC and WHR, the interviewed population is divided into two groups: those with a good psychological state and those with a bad psychological state. This result may suggest that there is no significant relation between psychological state and obesity. This is in disagreement with other studies that show obese women generally have a deteriorated psychological state [55].

The perceived changes in appearance related to weight gain, abdominal obesity, and hip circumference do

not appear to affect self-esteem. The psychological state of the interviewed population remains relatively high compared to other studies [56-60]. However, negative psychological states are likely due to other social factors such as lifestyle, interpersonal relationships, socio-cultural norms, level of education, and societal traditions that can cause women to feel depressed and anxious.

5. STUDY LIMITATIONS

Although this study offers valuable insights into the relationship between anthropometric measurements and psychological states of menopausal women, several limitations must be acknowledged. First, the study sample was limited to 199 menopausal women from the Nador region in Morocco, a population that is relatively more conservative and has lower educational levels compared to other regions. This regional and socio-cultural specificity may limit the generalizability of the findings to other populations, particularly in more urban or culturally distinct areas. Second, the study primarily relied on self-reported data for measuring psychological states, body image perceptions, and self-esteem, which may introduce biases such as social desirability or inaccuracies in self-assessment. Future studies incorporating objective measures or multi-method assessments could provide a more accurate evaluation of the psychological outcomes in this context. Additionally, as the study used cross-sectional data, it cannot establish causal relationships between anthropometric measures and psychological states. Longitudinal studies would be needed to explore how these factors evolve over time and whether body image perceptions influence psychological well-being throughout menopause. Furthermore, while we included widely used anthropometric measurements such as BMI, WC, and WHR, these measures do not capture all aspects of health, particularly regarding the distribution of fat and its metabolic impact on health outcomes. Lastly, the sample's relatively high levels of satisfaction with body image despite the high prevalence of obesity and abdominal fat may reflect regional cultural norms, which could limit the applicability of the findings to populations with different cultural perceptions of body image and health.

CONCLUSION

Menopause is a multifaceted life stage that involves not only hormonal and physical changes but also profound psychological and metabolic shifts. While weight gain is often the most discussed issue during this transition, other physical changes, such as shifts in muscle mass, bone density, and skin elasticity, also significantly impact a woman's experience of menopause. These changes can influence not only the physical appearance but also contribute to shifts in self-perception and mental well-being. This study provides valuable insights into the complex relationship between anthropometric changes, including body weight and fat distribution, and psychological health during menopause. Despite a large percentage of women in the study reporting weight gain and abdominal obesity, the data suggest that these physical changes did not necessarily lead to adverse effects on their self-esteem or overall psychological well-being. These findings highlight the importance of

considering the broader social, cultural, and individual factors that may influence how menopausal women perceive and adapt to their physical transformations. Cultural norms, societal expectations, and individual coping strategies may significantly affect women's responses to changes in body image during menopause. In some contexts, cultural perceptions of beauty and aging may shape how women view themselves, potentially mitigating or exacerbating the psychological effects of physical changes. Recognizing these factors is crucial for understanding the full scope of body image issues during menopause and for promoting a more holistic approach to women's health during this transitional period. This study also calls attention to the need for further research that explores the interplay between these various factors. Future studies should focus on the role of cultural context and social support networks in shaping the menopausal experience, as well as the potential psychological benefits of interventions aimed at improving body image. By incorporating a broader, more nuanced understanding of how menopausal women perceive their bodies, healthcare providers can develop more targeted and effective strategies to address mental health concerns during this phase of life. Additionally, interventions tailored to enhance self-esteem and body satisfaction in menopausal women may help improve psychological outcomes and overall quality of life. This could include counseling and lifestyle interventions focused on body positivity or community-based programs that address the unique needs of women during menopause. As the global population of menopausal women continues to grow, addressing these issues will be increasingly important for improving women's health outcomes across diverse cultural settings. In conclusion, while this study contributes valuable knowledge regarding the relationship between body image and psychological health during menopause, it also opens the door to more comprehensive research and intervention development. Further exploration is necessary to refine our understanding of the factors that shape menopausal women's experiences and to ensure that healthcare strategies are culturally sensitive, effective, and inclusive.

AUTHORS' CONTRIBUTIONS

S.E: Conceptualized and conducted the study; A.M, S.B: Supervised and conducted the field research; G.A: and H.N: Contributed to the analysis and discussion. All authors read and approved the final manuscript.

LIST OF ABBREVIATIONS

BMI	=	Body mass index
BICI	=	Body image concern inventory
GAD-7	=	Generalized anxiety disorder scale
LAQ	=	Lifestyle assessment questionnaire

ETHICAL STATEMENT

Formal ethical approval was not required for this study according to the policies of the Multidisciplinary Faculty of Nador, as the research was retrospective, survey-based, and involved anonymized data collection.

CONSENT FOR PUBLICATION

Informed consent was obtained from the participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in Zenodo at [<https://doi.org/10.5281/zenodo.15297448>], reference number 15297448.

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None.

CONFLICT OF INTERESTS

The authors declare that they have no competing interests.

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SUPPLEMENTARY MATERIAL

Supplementary material is available on the publisher's website along with the published article.

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