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Original Research Article

Impact of ultra-processed food consumption on quality of life of menopausal women

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ABSTRACT

Background: Menopause is linked with many psychological, physical, and social changes that may profoundly impact the quality of life of women. The dietary patterns, especially the trend of rising consumption of ultra-processed foods, have been proposed to influence health outcomes, although their effect on menopausal quality of life remains underexplored.

Methods: The study was a cross-sectional, survey-based research among 56 women aged 40 years and above residing in Punjab, north India. The study was conducted at the Punjab Institute of Medical Sciences, over a period of 4 months (September 2025-December 2025). A food frequency questionnaire was used to measure the UPF intake based on the NOVA classification, and the menopausal quality of life (MENQOL) questionnaire to assess symptoms across vasomotor, psychosocial, physical, and sexual domains. Correlation analysis was done to find out the correlation between UPF consumption and MENQOL scores.

Results: The mean UPF score was 12.41, while the mean total MENQOL score was 57.77. There was a weak positive correlation between UPF consumption and total MENQOL score ($r=0.17$). The psychosocial domain showed the highest correlation ($r=0.20$), followed by the vasomotor domain ($r=0.15$) and the physical domain ($r=0.14$), with the sexual domain showing negligible correlation ($r=0.03$).

Conclusions: The study suggests a weak positive association between ultra-processed food and the quality of life among menopausal women. A relatively higher impact on the psychosocial well-being was associated with ultra-processed food consumption. Although the correlation is low, the findings suggest the possible role of dietary patterns in menopausal health and the need for further research in this field.

Keywords: Dietary patterns, FFQ, Menopause, MENQOL, Quality of life, Ultra-processed food

INTRODUCTION

Menopause is a natural phase of the aging process in women, which causes the end of the menstrual cycle and fluctuations in hormone levels. The decrease in oestrogen during this phase may affect quality of life. Such alterations might have a direct impact on energy levels, mood, sexual relationships, and the quality of sleep.¹ When a woman has not experienced her monthly menstrual period for 12 months, she is said to be in menopause. Menopausal transformation is accompanied by hormonal

changes, which may cause physical manifestations in the body. Hot flashes, mood swings, or insomnia are the most common complaints women report.² Other health complications that might arise during menopause include heart disease, osteoporosis, and diabetes.^{2,3} The menopause period in women occurs between the ages of 45 and 55 years and is the cessation of the reproductive process in women. Menopause transition is not abrupt, and its onset is gradual and passes through various stages. This stage, the previous perimenopause, and the following post-menopause bring about dramatic changes in hormones

affecting physical, psychosocial, and social well-being.^{4,5} Dietary patterns have also been introduced as a very important but neglected determinant of the health of women in the menopausal transition. The increasing consumption of UPFs is a topic that has attracted attention worldwide.⁶

According to the NOVA system, UPFs are industrial preparations derived from foods or synthesized in laboratories. They are usually high in sugars, sodium, and poor fats, additives, and low in fibre and essential nutrients.⁷ There is evidence to indicate that an increase in the intake of UPF is strongly linked with the occurrence of adverse metabolic changes in menopausal women. Increased consumption of UPFs has been associated with obesity, metabolic changes, cardiovascular diseases, as well as mental health issues, which may further worsen menopausal symptoms.⁸

Punjab, like most other states in India, is experiencing a rapid nutrition transition, with the reliance on UPFs due to urbanisation, busy lifestyles, and aggressive food marketing. Nevertheless, the study in this region on the effects of such eating habits on the menopausal quality of life in menopausal women is limited.

Quality of life is a general term that is associated with all the physical, mental, and social well-being of a person. The correlation between menopause and quality of life is complex.⁹ Menopause can affect all aspects of quality of life, like physical health, vitality, mood, sleep, cognition, sexual health, intimate relationships, social engagement, and everyday functioning. The menopause quality of life questionnaire (MENQOL) is a validated tool that is used to measure the effects of menopausal related symptoms in four domains, i.e., vasomotor, psychosocial, physical, and sexual. The relationship between UPF consumption and menopause-specific QOL among women in Punjab will not only provide region-specific evidence but also be helpful in designing preventive interventions, nutrition counselling programmes, and public health interventions that are region-specific and are designed to meet the needs of women. The NOVA classification has become common in international studies on the dietary practices of women, but it has been seldom utilised in studies that have focused on menopausal women.¹⁰ Ultra-processed foods are a great concern in societal health since they have been linked to diseases, and the risk of death in adulthood is increased.¹¹ The US National Health and Nutrition Examination Survey data shows that an additional serving of UPFs consumed at the cost of unprocessed or minimally processed foods is linked to a quality of life, which is likely to trigger potential depressive symptoms and other related health problems.¹²

METHODS

This was a cross-sectional, survey-based study that was conducted to assess the impact of UPF consumption on the quality of life of menopausal women. The study employed

validated questionnaires to assess dietary intake patterns and menopausal quality of life parameters.

The study was conducted in women residing in Punjab, north India. Data was collected from women aged 40 and above at the Punjab Institute of Medical Sciences and Hospital, Punjab, India, over a period of 4 months (September 2025-December 2025).

Participants included women who were experiencing, or were not sure about, menopausal symptoms. The women were either in their peri-menopausal, menopausal, or post-menopausal stage. Every participant was interviewed in person.

Inclusion criteria

The study included women aged 40 years and above who were in the peri-menopausal, menopausal, or post-menopausal stage and were willing to provide consent and participate in the survey.

Exclusion criteria

Patients with advanced chronic disorders (e.g., cancer, advanced hepatic/renal disease) affecting dietary patterns or quality of life were excluded from the study. Women receiving HRT (hormonal replacement therapy) or medications influencing menopausal symptoms were also excluded. In addition, women who were unwilling to provide consent or decline taking part in the survey were excluded from the study.

Data collection tools

Two validated tools were being used to assess the impact of dietary intake on the QOL of participants. A MENQOL (menopausal quality of life) questionnaire- to measure the quality of life across 4 major domains, i.e., vasomotor, psychosocial, physical, and sexual, and a FFQ (food frequency questionnaire)- to assess the intake of UPF's (ultra- processed foods), including packed food, ready-to-eat snacks, and bakery products.

RESULTS

The demographic characteristics of the participants are presented in Table 1. Among the 56 participants, 30.4% were women who were perimenopausal (current irregular menstruation with menopausal symptoms), while 14.3% were menopausal (suggesting recent termination of menstruation and related symptoms). Of the study population, 21.4% were women who had not had periods for 12 months or more (postmenopausal women). Further, 33.9% of the subjects have no idea or were undiagnosed about their menopausal status. The majority of the women in the study were predominantly in the 40-45 age group (46.4%). The results showed that most of the participants were in the early menopausal transition stage. The majority were postgraduates or had attained higher qualifications,

with 51.8% of the participants, followed by women with a Bachelor's degree (30.4%). This result indicates that the majority of participants had a well-qualified background, which might contribute to their awareness of dietary habits and menopausal health. Most women were homemakers (55.4%), and 26.8% worked full-time. The majority of respondents were married (82.1%), followed by a smaller portion of single women or those who were not married (8.9%), indicating that the marital status of participants can influence menopausal health during menopause.

Table 1: Demographic characteristics.

Variables	Frequency	Percentage
Age group (years)		
40-45	26	46.4
46-50	18	32.1
51-58	12	21.4
Menopausal status		
Perimenopausal	17	30.4
Menopausal	8	14.3
Postmenopausal	12	21.4
Not sure/ undiagnosed	19	33.9
Education level		
No formal education	6	10.7
School level (up to 12 th)	4	7.1
Graduate	17	30.4
Post graduate and above	29	51.8
Occupation		
Homemaker	31	55.4
Full-time employed	15	26.8
Part-time employed	6	10.7
Retired	4	7.1
Marital status		
Single/never married	5	8.9
Married	46	82.1

A dietary assessment revealed that 58.9% of women consumed three meals per day, suggesting relatively consistent nutrition among participants. Regularly eating out of the home was common, with 75% of participants eating out one to two times per week, suggesting that they are regularly exposed to commercially prepared foods. In terms of lifestyle habits, 62.5% women stated that they did not consume alcohol at all, and 37.5% stated that they occasionally drank alcohol. Most women were non-smokers (91.1%), minimizing the potential confounding of smoking with menopausal symptoms. Among all respondents, 32.1% practiced physical activity daily, and 23.2% practiced four to six times a week.

A total of 56 participants were included in the study. The Mean UPF consumption score among participants was 12.41, indicating a moderate level of consumption of UPF foods. The score was calculated based on the frequency of consumption of food items from the NOVA group 4, which was evaluated using the food frequency questionnaire (FFQ). MENQOL scores of the participants are presented

in Table 2. Participants reported menopausal symptoms on a scale of 0 to 6, where 0 indicated "not bothersome", 1-2 indicated "mildly bothersome", 3-4 indicated "moderately bothersome", and 5-6 indicated "severely bothersome".

Table 2: MENQOL mean scores.

Variables	Mean score
Vasomotor	3.54
Psychosocial	13.02
Physical	34.91
Sexual	6.3
Total MENQOL	57.77

The majority of symptoms were reported at mild to moderate levels of severity across MENQOL domains, with only a minority of participants reporting severe bothersome symptoms. In the vasomotor domain, symptoms such as hot flushes and night sweats were relatively less bothersome for a significant number of women, with many women having scores around or near 0. In the psychosocial area, anxiety, memory problems, dissatisfaction with personal life, feeling depressed, wanting to be alone, and being impatient were frequently reported, but at a mild to moderate level. A small number of participants reported severe psychosocial symptoms. Overall, most symptoms were observed in the physical domain. Aching muscles or joints, feeling tired, bloated, reduced stamina, and body aches were commonly reported symptoms. The sexual domain had relatively fewer symptoms. Only a small number of women reported vaginal dryness and avoidance of intimacy, which resulted in a negligible association with UPF consumption and sexual domain MENQOL scores. The highest mean MENQOL score was found in the physical domain (34.91), suggesting that physical symptoms were the most significant aspect of menopausal symptom burden for participants. The mean score for the psychosocial domain was the second highest (13.02), with the vasomotor and sexual domains having lower mean scores. The mean score for the total MENQOL was 57.77, indicating moderate symptom burden from menopause among participants. There was a generally high mean score for the physical domain of the MENQOL, suggesting this domain made the largest contribution to the overall discomfort in menopause. Participants did have emotional and psychological disturbances in the psychosocial domain, which had the second-highest mean score, while the vasomotor and sexual symptoms had relatively lower mean scores.

Table 3: Correlation analysis.

MENQOL domain	Correlation with UPF
Vasomotor	0.15
Psychosocial	0.20
Physical	0.14
Sexual	0.03
Total MENQOL	0.17

A correlation between UPF consumption and MENQOL scores was conducted at the domain level and is presented in Table 3. A weak positive correlation was observed between UPF consumption and MENQOL scores. A higher UPF consumption was related to a greater burden of menopausal symptoms. Analysis of the correlation revealed a high correlation, suggesting that higher UPF consumption may be linked to menopause symptoms. Domain-wise analysis disclosed that the psychosocial domain ($r=0.20$) had the highest correlation with UPF consumption, followed by the vasomotor domain ($r=0.15$), the physical domain ($r=0.14$), and the lowest correlation in the sexual domain ($r=0.03$). According to the results, psychological and emotional aspects of menopausal quality of life may be more affected by a higher intake of ultra-processed foods than any other MENQOL domains. Hence, the physical domain (with the highest mean MENQOL score) had participants reporting the highest burden of physical symptoms. Correlation analysis indicated that the strongest correlation was observed between the psychosocial domain and UPF intake ($r=0.20$).

DISCUSSION

The current study aimed to evaluate the effect of ultra-processed foods (UPFs) on the quality of life in menopausal women. The study presented a weak positive correlation between the UPFs and MENQOL total scores ($r=0.17$), suggesting that a higher intake of ultra-processed foods may be associated with a poorer quality of life, even though the strength of the association was modest. This aligns with the findings of Hosseininasab et al study, which showed that higher consumption of ultra-processed foods correlated with worsened physical and mental health, indicating that dietary patterns really impact the overall well-being of women. They found an association between consuming a high amount of UPFs and having a lower quality of life for women.⁹

While our study results were broken down into four domains of MENQOL, the psychosocial domain was found to be the most correlated ($r=0.20$), followed by the vasomotor domain ($r=0.15$) and the physical domain ($r=0.14$), with the lowest correlation in the sexual domain ($r=0.13$). This could indicate that UPF consumption may have a fairly greater influence on psychosocial and emotional health in menopause. Our findings are consistent with a previous study conducted on postmenopausal women, which showed that women significantly faced higher odds of anxiety and depressive symptoms.⁷ The study also indicates that a higher intake of ultra-processed foods was associated with a poorer quality of life, particularly in terms of mobility and mental health.⁷ The study found that unhealthy diets may have negative effects on menopausal health and emotional well-being. In support of this, a NutriNet Brasil Cohort study showed that each 10% increase in the share of UPFs was associated with a 10% increase in depressive symptoms.¹³ An umbrella review that looked at multiple meta-analyses concluded that the evidence connecting ultra-processed

foods (UPFs) to depression, anxiety, and general mental health issues is highly suggestive to convincing; however, the overall quality of this evidence was frequently noted as being low.¹⁴

In the psychosocial area, several participants reported mild-to-moderate symptoms of anxiety, irritability, poor memory, dissatisfaction with personal life, and a desire to be alone. Given that the psychosocial domain had the strongest correlation with the UPFs, these observations may suggest a potential link between dietary habits and mood during menopause. The present finding aligns with previous research on the role of dietary habits in determining women's menopausal symptom burden and health-related quality of life.¹⁵ According to the study, postmenopausal women who consume more of the most processed food category tend to report more severe vasomotor, sexual, somatic, and memory and attention symptoms. By contrast, it states that the greater the vegetable intake, the fewer the symptoms.¹⁵ This suggests dietary quality is a significant modulator of physical and mental symptoms associated with menopause.

There was a relatively greater burden of symptoms in the physical domain. Backaches were commonly reported, with several women experiencing moderate to severe discomfort. Mild to moderate headaches were also prevalent. Other symptoms included weight gain and alterations in skin appearance or texture. Fatigue (reduced stamina or energy), aches and pains in muscles and joints, bloated abdomen, or fatigue were reported at different levels of severity, suggesting that physical symptoms had a significant impact on overall MENQOL scores. A recent study conducted on Indian women revealed that the physical and psychosocial aspects of quality of life showed the highest average scores on the MENQOL scale. This suggests they had a greater impact compared to other areas.¹⁶ Specifically, the physical domain was highly impacted, followed by the vasomotor and psychosocial domains, with the sexual domain being the least affected. Common physical issues included fatigue, joint pain, and poor sleep, while sexual symptoms were mentioned rarely.¹⁶ The physical domain, however, had a weak correlation with UPF ($r=0.14$). This shows that, while physical symptoms are a significant part of menopausal quality of life, the relationship between ultra-processed food intake and physical symptoms seems to be relatively weak. In line with this, a study investigated the quality of life in postmenopausal women and found that several factors, including physical and emotional health, as well as lifestyle characteristics, are associated with influencing quality of life during menopause.⁷ One of the studies even mentioned that the quality of life of perimenopausal women is influenced by a multifactorial interplay among lifestyle behaviours, psychological factors, and chronic health conditions, which indicates the need for earlier screening measures to focus on these factors to implement timely and appropriate specific interventions, especially those addressing sleep disturbances, mental health issues, and physical activity.¹⁶

Surprisingly, the responses found in the sexual domain were comparatively low. A moderately higher number of women reported that they were not bothered by vaginal dryness during intercourse or when avoiding sexual intimacy. While some participants reported a decrease in sexual desire, associations between UPF intake and the sexual domain were still limited. In contrast, a study found that as a woman's menopausal status advances, sexual function deteriorates. Low sexual desire (40-55%) and inadequate lubrication are the most commonly reported symptoms.¹⁷ Sexual dysfunction during menopause is largely caused by declining levels of sex steroids, especially oestrogens and androgens. However, age-related, psychological, and relational changes, as well as rising metabolic and cardiovascular comorbidities, also contribute to sexual dysfunction in menopause.¹⁷ Furthermore, results from a general epidemiological study suggest that ultra-processed food consumption is associated with health-related outcomes, including a higher risk of chronic diseases like colorectal cancer and metabolic diseases.¹⁸ This is most likely due to factors such as inflammation, gut microbiota dysbiosis, and metabolic disturbances. These mechanisms may also play a role in worsening menopausal symptoms and impacting quality of life.¹⁸ The studies into menopausal health have assessed that symptoms, including sleep disturbances, sexual dysfunction, and gastrointestinal symptoms, harm the quality of life and are often related to dietary factors.¹⁹⁻²¹ These observations suggest that a combination of factors plays a role in the symptom experience and quality of life of menopausal women.

The study had a relatively small sample size (n=56) and relied on self-reported dietary information, which may have influenced the variations in responses, thus affecting the magnitude of association. However, it provides preliminary insights that could prove valuable, even in the face of these limitations, in providing information regarding the possible association between consumption of ultra-processed foods and the quality of life for menopausal women in Punjab, north India. Nonetheless, the study offers crucial initial evidence of the association between ultra-processed food intake and menopause. Overall, the results indicate that although UPF intake is weakly associated with MENQOL, it follows a consistent trend observed in the existing literature linking higher UPF intake with lower quality of life and health. This research suggests the need to explore dietary factors as a part of a holistic approach to improve menopausal well-being. The study also emphasizes the need for a comprehensive strategy to enhance menopausal health, including healthier dietary habits and lifestyle changes.

CONCLUSION

The present study found the relationship between ultra-processed food consumption and quality of life among menopausal women. The results showed a weak positive association between increased consumption of ultra-

processed foods and increased menopausal symptoms, especially those related to the psychosocial domain.

Although the strength of association was modest, the results suggest that eating habits can still have a contributory role in determining the overall well-being of menopausal women. As menopause is a multifactorial condition, the influence of ultra-processed foods may be one of many interacting factors affecting quality of life.

The study emphasizes the role of promoting healthier food habits and reducing the consumption of ultra-processed foods as a wider measure to enhance menopausal health. To gain deeper insights into the long-term implications of dietary habits on the quality of life during menopause, further studies are required with large sample sizes and longitudinal designs. Overall, the results suggest that study participants more often experienced psychosocial and physical symptoms than vasomotor and sexual symptoms. The majority of symptoms were reported at mild to moderate levels of symptom burden, whereas only a smaller proportion of women reported a severe burden of symptoms.

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