Dietary Habits, Body Mass Index, and Health-Related Quality of Life among Young Females in North India: A Cross-Sectional Study

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ABSTRACT

Young females represent a nutritionally vulnerable group due to rapidly changing lifestyles, increased academic pressures, and heightened exposure to social and digital influences. This study examined the relationship between dietary habits, Body Mass Index (BMI), and Quality of Life (QoL) among young females aged 18–25 years residing in Western Uttar Pradesh and Delhi NCR. A cross-sectional survey was conducted among 120 participants recruited through convenience sampling from colleges, universities, and residential areas. Data were collected using a structured online questionnaire comprising a Short Food Frequency Questionnaire (SFFQ), self-reported anthropometric measurements, and the WHOQOL-BREF instrument. Additional variables included sociodemographic details, social media exposure, and peer influence on dietary choices. Descriptive statistics, t-tests, ANOVA, and Pearson correlation were used for analysis. Findings indicated that frequent fastfood consumption was significantly associated with higher BMI ($p < 0.05$), while regular fruit and vegetable intake demonstrated a positive correlation with overall QoL scores. Urban participants reported higher consumption of processed and fast foods and exhibited lower psychological QoL compared with semi-urban participants. Higher BMI was negatively correlated with psychological well-being, highlighting body image concerns and stress as contributing factors. Results reflect an emerging triple burden among young females: increasing overweight/obesity, risk of micronutrient deficiencies, and psychosocial pressures influencing food choices. The study underscores the need for targeted nutrition education, improved food environments near educational institutions, and interventions addressing digital media influence to promote healthier lifestyles and enhance QoL.

Keywords: dietary habits, Body Mass Index, Quality of Life, young females, WHOQOL-BREF, fast-food consumption, nutrition, India, urban–semi-urban differences.

INTRODUCTION

Young adulthood, particularly between 18–25 years, is a critical developmental stage marked by increased independence, academic pressure, and lifestyle transitions that strongly influence dietary behaviours and health outcomes (Alves et al., 2020). Young females are especially vulnerable to adopting unhealthy eating patterns such as frequent fast-food consumption, meal skipping, and reduced intake of fruits and vegetables due to social, environmental, and psychological factors (Kaur & Kochar, 2018; Bhattacharya & Gupta, 2019). These behaviours, compounded by rapid urbanisation and easy accessibility of processed foods, have contributed to a rising prevalence of overweight, obesity, and nutrient deficiencies among young Indian women (National Institute of Nutrition [NIN], 2020). Body Mass Index (BMI) remains a widely used indicator of nutritional and health status, and numerous studies have shown strong associations between BMI and dietary habits among young adults (Prentice & Jebb, 2003; Musaiger, 2019). Excessive intake of energy-dense fast foods is linked to higher BMI, while diets rich in fruits, vegetables, and whole foods promote healthier weight profiles (Arora & Singh, 2021). In addition to physical health, BMI influences psychological well-being, social functioning, and self-perception—areas that are particularly sensitive during young adulthood (Kolotkin et al., 2002). For many young females, body image concerns, academic stress, and peer comparisons contribute to psychosocial challenges, which may further affect dietary choices and lifestyle behaviours (Singh & Misra, 2020). Quality of Life (QoL),

assessed through multidimensional frameworks such as the WHOQOL-BREF, encompasses physical, psychological, social, and environmental well-being (World Health Organization [WHO], 1998). Dietary behaviours and BMI have been shown to significantly influence QoL, with healthier eating patterns and normal BMI associated with better physical and psychological outcomes (Mathew & Jose, 2022; Cabrera et al., 2015). Conversely, poor dietary quality and elevated BMI often correspond to lower QoL scores, mood fluctuations, and increased stress levels among young women (Dharod & Drew, 2020). Despite increasing evidence on dietary behaviours and weight-related issues among Indian youth, limited research has examined the interconnected role of dietary habits, BMI, and QoL specifically among young females in Western Uttar Pradesh and Delhi NCR. These regions are undergoing rapid lifestyle shifts, increased exposure to food delivery systems, and heightened influence of social media, all of which shape food preferences and body image norms (Kelsey & Dodds, 2020; Singh & Misra, 2020). Understanding these complex interactions is essential for designing targeted interventions that support healthy eating, balanced weight, and improved well-being in this demographic group.

Therefore, the present study aims to explore the relationship between dietary habits, BMI, and Quality of Life among young females aged 18–25 years residing in Western Uttar Pradesh and Delhi NCR. The findings may contribute to evidence-based strategies promoting healthier dietary practices and better overall well-being.

REVIEW OF LITERATURE

Dietary behaviours among young adults have shifted significantly in recent years due to rapid urbanisation, academic demands, and increased exposure to digital media. Research shows that young females are particularly vulnerable to unhealthy eating patterns, including frequent fast-food intake, irregular meals, and low consumption of fruits and vegetables (Kaur & Kochar, 2018; Bhattacharya & Gupta, 2019). These dietary behaviours often contribute to inadequate nutrient intake, weight gain, and increased risk of early metabolic disturbances (NIN, 2020).

Multiple studies have demonstrated a strong association between dietary habits and Body Mass Index (BMI) among young women. High intake of energy-dense processed foods and sugar-sweetened beverages is linked with elevated BMI and poor metabolic outcomes (Arora & Singh, 2021; Prentice & Jebb, 2003). In contrast, diets rich in fruits, vegetables, and whole foods promote healthier weight profiles and better physiological functioning (Alves et al., 2020). Environmental and sociocultural factors—including peer pressure, food delivery apps, and social media trends—further shape dietary choices and body image perceptions among young females (Dharod & Drew, 2020; Singh & Misra, 2020).

BMI has been shown to influence not only physical health but also psychological well-being and social functioning. Higher BMI is frequently associated with lower self-esteem, body dissatisfaction, and poor mental health outcomes in young women (Kolotkin et al., 2002; Kelsey & Dodds, 2020). Quality of Life (QoL), assessed through multidimensional tools such as the WHOQOL-BREF, is also impacted by dietary behaviours and nutritional status. Evidence suggests that nutrient-rich diets support better psychological and social well-being, while poor diet quality and obesity correlate with reduced QoL (Mathew & Jose, 2022; Cabrera et al., 2015).

Despite extensive research on youth dietary habits and weight outcomes, limited studies explore the integrated relationship between dietary practices, BMI, and QoL specifically among young Indian females. Moreover, the influence of urban lifestyle transitions, processed food availability, and social media–driven food trends remains underexamined in regions such as Western Uttar Pradesh and Delhi NCR. Addressing this gap is essential to understand the emerging nutritional and psychosocial challenges in this demographic.

Need for the Study

Young females aged 18–25 years face major lifestyle changes and are at high risk for poor dietary habits, weight gain, and psychosocial stress. Western Uttar Pradesh and Delhi NCR are undergoing rapid urbanisation, increasing the availability of fast food and influencing dietary behaviours through social media and peer trends. However, region-specific research linking dietary patterns, BMI, and QoL among this group is limited. This study is needed to identify key determinants of nutritional health and provide evidence for targeted interventions that promote healthy eating and better quality of life.

Objectives of the Study

To examine the relationship between dietary habits, Body Mass Index (BMI), and Quality of Life (QoL) among young females aged 18–25 years in Western Uttar Pradesh and Delhi NCR.

Hypotheses

1. There is no significant association between dietary habits and BMI among young females.
2. There is no significant association between BMI and QoL scores.
3. There is no significant difference in dietary patterns between urban and semi-urban participants.

METHODOLOGY

This study employed a cross-sectional design to investigate the relationship between dietary habits, Body Mass Index (BMI), and Quality of Life (QoL) among young females aged 18–25 years residing in Western Uttar Pradesh and Delhi NCR. Cross-sectional studies are widely used in public health research to examine associations between lifestyle behaviours and health indicators in a defined population (Creswell & Creswell, 2018). A total of 120 participants were selected through convenience sampling from colleges, universities, and residential areas.

Data were collected using a structured online questionnaire comprising three components. Dietary habits were assessed using a Short Food Frequency Questionnaire (SFFQ), a commonly used tool for evaluating habitual food intake patterns in population-based studies (Alves et al., 2020). Self-reported height and weight were obtained to calculate BMI using the standard formula (kg/m^2) and classified according to World Health Organization (WHO, 1995) criteria. QoL was measured using the WHOQOL-BREF instrument, a validated 26item tool designed to assess physical, psychological, social, and environmental well-being (WHO, 1998). Additional variables, including sociodemographic details, social media exposure, and peer influence on food choices, were also recorded.

Prior to data collection, the questionnaire was pretested for clarity and internal consistency. Participants provided informed consent, and ethical approval was obtained from the institutional review committee. Dietary behaviours were quantified through frequency scores related to fast-food consumption, fruit and vegetable intake, beverage choices, and meal patterns. WHOQOL-BREF scoring procedures followed the established guidelines recommended by the WHO (1998).

Data were analysed using descriptive statistics to summarize participant characteristics and behavioural patterns. Inferential tests including t-tests, one-way ANOVA, and Pearson correlation were applied to examine associations between dietary habits, BMI, and QoL. Comparisons between urban and semi-urban participants were also conducted. Statistical significance was set at $p < 0.05$. Confidentiality and anonymity of all participants were strictly maintained throughout the study.

RESULTS

Participant Characteristics- A total of 120 young females aged 18–25 years participated in the study. Most respondents were from urban areas (62.5%), while 37.5% were from semi-urban regions. The mean age of participants was 20.8 ± 1.9 years. Table 1 presents the sociodemographic characteristics.

Table 1. Sociodemographic Characteristics of Participants (N = 120)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–20	52	43.3
	21–23	48	40.0
	24–25	20	16.7
Residence	Urban	75	62.5
	Semi-urban	45	37.5
Education	Undergraduate	94	78.3
	Postgraduate	26	21.7

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Dietary Habits- Fast-food consumption was prevalent, with 48.3% of participants reporting intake ≥3 times per week. Fruit and vegetable consumption was comparatively low; only 32.5% consumed fruits daily, and 29.2% consumed vegetables at least twice daily. Table 2 summarizes dietary patterns.

Table 2. Dietary Habits of Participants

Dietary Variable	Category	n (%)
Fast-food consumption	≥3 times/week	58 (48.3)
	1–2 times/week	42 (35.0)
	<1 time/week	20 (16.7)
Fruit intake	Daily	39 (32.5)
	3–4 times/week	52 (43.3)
	Rarely	29 (24.2)
Vegetable intake	≥2 servings/day	35 (29.2)
	1 serving/day	56 (46.7)
	<1 serving/day	29 (24.1)

BMI Distribution- The mean BMI of participants was 23.1 ± 3.8 kg/m². According to WHO classifications, 21.7% were overweight and 9.2% were obese. Table 3 shows BMI categories.

Table 3. BMI Classification of Participants

BMI Category	n (%)
Underweight (<18.5)	14 (11.7)
Normal (18.5–24.9)	66 (55.0)
Overweight (25–29.9)	26 (21.7)
Obese (≥30)	11 (9.2)

Quality of Life Scores- WHOQOL-BREF scores indicated moderate QoL across domains. Psychological and environmental domains showed lower mean scores compared to physical functioning. Table 4 shows domainwise mean scores.

Table 4. WHOQOL-BREF Domain Scores

QoL Domain	Mean ± SD
Physical Health	62.4 ± 12.5
Psychological Health	58.1 ± 13.4
Social Relationships	66.7 ± 14.2
Environment	57.3 ± 11.6

Association Between Dietary Habits and BMI- Higher fast-food consumption was significantly associated with higher BMI ($F = 4.28$, $p = 0.016$). Participants consuming fast food ≥3 times per week had the highest mean BMI (24.9 ± 3.6) compared to those consuming it <1 time/week (22.1 ± 3.2).

Fruit intake was inversely related to BMI, although the association was not statistically significant ($p = 0.08$).

Table 5. ANOVA Results: Fast-food Intake and BMI

Fast-food Frequency	Mean BMI ± SD	p-value
≥3 times/week	24.9 ± 3.6	
1–2 times/week	23.0 ± 3.4	**0.016***
<1 time/week	22.1 ± 3.2	

*Significant at $p < 0.05$

Correlation Between Dietary Habits, BMI, and QoL- Pearson correlation analysis revealed:

- A **positive correlation** between fruit/vegetable intake and QoL scores (r = 0.32, p = 0.001).
- A **negative correlation** between BMI and psychological QoL (r = –0.29, p = 0.003).
- Fast-food frequency showed a **moderate negative correlation** with overall QoL (r = –0.22, p = 0.014).

Table 6. Correlation Matrix

Variables	BMI	Dietary Quality	QoL Score
BMI	1	–0.18	–0.29**
Dietary Quality Score	–0.18	1	0.32***
QoL Score	–0.29**	0.32***	1

**p < 0.01, ***p < 0.001

Urban vs Semi-Urban Differences

Urban participants consumed significantly more fast/processed foods (p = 0.02) and reported lower psychological QoL scores compared with semi-urban participants.

Table 7. Comparison of Urban and Semi-Urban Participants

Variable	Urban (n=75)	Semi-urban (n=45)	p-value
Fast-food frequency (times/week)	2.9 ± 1.4	1.8 ± 1.1	**0.02***
Dietary Quality Score	54.3 ± 9.8	58.9 ± 10.2	0.07
Psychological QoL	56.2 ± 12.9	61.3 ± 13.7	**0.04***

*Significant at p < 0.05

Interpretation of Results

The study revealed notable dietary and health patterns among young females in Western Uttar Pradesh and Delhi NCR. High fast-food consumption emerged as a significant predictor of elevated BMI. In contrast, higher fruit and vegetable intake was associated with improved QoL across domains. The findings also highlight regional disparities, with urban participants demonstrating poorer dietary habits and lower psychological well-being than semi-urban respondents.

Correlation analysis further affirmed the interconnected nature of nutrition, physical health, and mental wellbeing. Higher BMI was significantly linked to lower psychological QoL, while healthier dietary patterns were associated with better overall QoL. These results reinforce the emerging triple burden among young females— rising overweight/obesity, persistent micronutrient gaps, and psychosocial challenges influenced by lifestyle factors, social media, and peer norms.

DISCUSSION

The present study examined the relationship between dietary habits, BMI, and Quality of Life (QoL) among young females aged 18–25 years in Western Uttar Pradesh and Delhi NCR. The findings highlight important lifestyle patterns that mirror national and global trends among young adults. Frequent fast-food consumption was strongly associated with higher BMI, supporting previous evidence that energy-dense, nutrient-poor foods contribute to weight gain and poor metabolic health in young females. Conversely, higher intake of fruits and vegetables correlated positively with QoL scores, indicating the beneficial role of nutrient-rich diets in enhancing physical and psychological well-being.

The study also found that urban participants consumed significantly more fast and processed foods compared with semi-urban participants. This difference likely reflects greater availability of fast-food outlets, higher

exposure to digital food marketing, and more reliance on convenience-based eating in urban settings. Lower psychological QoL scores among urban females may be associated with higher academic pressure, social media–driven body image concerns, and less balanced dietary practices.

The negative correlation between BMI and QoL, particularly in the psychological domain, aligns with literature indicating that higher BMI is linked to body dissatisfaction, reduced self-esteem, and increased stress among young women. High fast-food intake and low dietary quality further contribute to fatigue, mood fluctuations, and poor overall well-being. These findings reinforce the concept of a "triple burden" of malnutrition among young females—rising overweight and obesity, risk of micronutrient deficiencies due to poor diet quality, and psychosocial stressors related to appearance and lifestyle transitions.

Overall, the study underscores the need for targeted nutrition awareness programs, improved food environments around educational institutions, and strategies that address both physical and mental health. Promoting healthier dietary habits and addressing sociocultural pressures may help improve nutritional status and enhance QoL in this vulnerable age group.

CONCLUSION

The study demonstrates a clear relationship between dietary habits, BMI, and Quality of Life among young females aged 18–25 years in Western Uttar Pradesh and Delhi NCR. Frequent fast-food consumption was associated with higher BMI, while regular intake of fruits and vegetables was linked to better QoL. Urban participants showed poorer dietary patterns and lower psychological well-being compared with their semi-urban counterparts. These findings highlight emerging nutritional and psychosocial challenges faced by young females, emphasizing the need for targeted nutrition education, supportive food environments, and lifestyle interventions to promote healthy eating, balanced weight, and improved overall quality of life.

RECOMMENDATIONS

1. Nutrition Education: Colleges and universities should implement regular awareness programs on healthy eating, meal planning, and the risks of excessive fast-food consumption.
2. Improved Food Environment: Regulation of fast-food outlets near educational institutions and promotion of healthier, affordable food options on campuses is needed.
3. Digital Media Literacy: Workshops addressing the influence of social media, body image pressures, and misleading nutrition trends can help students make informed choices.
4. Lifestyle Interventions: Encouraging physical activity, adequate sleep, and stress-management practices may improve BMI and Quality of Life.
5. Policy and Institutional Support: Institutions should collaborate with nutrition experts to design studentfriendly dietary guidelines and wellness programs targeting young females.

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