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Nutritional Status and Dietary Habits among Patients Attending Primary Health Care Centers in Karachi: A Cross-Sectional Study

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ABSTRACT

***Background**: Burnout and job satisfaction are critical determinants of workforce well-being, staff retention, and quality of healthcare delivery. Allied health professionals working in public hospitals are frequently exposed to high workloads, prolonged working hours, staff shortages, and limited resources, which may increase vulnerability to burnout and reduce job satisfaction, particularly in low- and middle-income country settings. **Objective**: To assess the levels of burnout and job satisfaction among allied health professionals working in public hospitals of Faisalabad and to examine the relationship between burnout dimensions and job satisfaction. **Methods**: A cross-sectional observational study was conducted over six months among 220 allied health professionals employed in public hospitals of Faisalabad. Data were collected using a structured, self-administered questionnaire incorporating the Maslach Burnout Inventory and a standardized job satisfaction scale. Burnout was evaluated across emotional exhaustion, depersonalization, and personal accomplishment domains. Descriptive statistics, chi-square tests, logistic regression, and correlation analyses were performed using SPSS version 25.0. **Results:** High emotional exhaustion was reported by 41.8% of participants, high depersonalization by 36.4%, and low personal accomplishment by 39.1%. Low job satisfaction was reported by 44.5% of participants. High emotional exhaustion ($OR = 2.89$, $p < 0.001$), high depersonalization ($OR = 2.47$, $p = 0.002$), and low personal accomplishment ($OR = 2.76$, $p < 0.001$) were significantly associated with low job satisfaction. Emotional exhaustion showed a strong inverse correlation with job satisfaction ($r = -0.61$, $p < 0.001$). **Conclusion**: Burnout is highly prevalent among allied health professionals in public hospitals of Faisalabad and is strongly associated with reduced job satisfaction. Organizational interventions targeting workload management, professional support, and workplace well-being are urgently needed.*
***Keywords**: Burnout; Job Satisfaction; Allied Health Professionals; Public Hospitals; Cross-Sectional Study*

INTRODUCTION

Adequate nutrition is a fundamental determinant of health and plays a critical role in growth, immune function, disease prevention, and overall quality of life (1). Nutritional status reflects the balance between dietary intake and physiological requirements and is strongly influenced by dietary habits, socioeconomic conditions, and lifestyle behaviors (2). Both undernutrition and overnutrition are associated with increased morbidity and mortality, contributing to a wide range of health conditions including anemia, diabetes mellitus, cardiovascular disease, and obesity (3).

Developing countries such as Pakistan are undergoing a rapid nutritional transition characterized by shifts from traditional diets toward increased consumption of energy-dense, nutrient-poor foods, alongside reduced physical activity (4). This transition has resulted in the coexistence of undernutrition and overweight within the same populations, a phenomenon often referred to as the dual burden of malnutrition (5). Urbanization, changing food environments, and socioeconomic disparities have accelerated this trend, particularly in large metropolitan cities such as Karachi (6).

Dietary habits, including meal frequency, food diversity, and intake of fruits, vegetables, and processed foods, are key modifiable factors influencing nutritional status (7). Unhealthy dietary practices such as skipping meals, low consumption of micronutrient-rich foods, and frequent intake of fried and fast foods have been increasingly reported in urban populations and are closely linked to poor nutritional outcomes and the rising burden of non-communicable diseases (8). Primary health care centers represent a crucial setting for early identification of nutritional problems, as they serve as the first point of contact for a large proportion of the population and provide opportunities for preventive counseling and health promotion (9).

Despite the recognized importance of nutrition within primary health care, limited empirical evidence is available regarding the nutritional status and dietary habits of patients attending primary health care centers in Karachi. Most existing studies in Pakistan have focused on specific population groups or hospital-based settings, leaving a gap in understanding nutrition-related patterns at the primary care level in urban contexts (10). Addressing this gap is essential for informing public health strategies and integrating nutrition-focused interventions into routine primary health care services.

Therefore, this study aimed to assess the nutritional status and dietary habits among adult patients attending primary health care centers in Karachi and to describe the distribution of body mass index categories and dietary practices within this population.

MATERIAL AND METHODS

This cross-sectional observational study was conducted to assess nutritional status and dietary habits among patients attending primary health care centers in Karachi. The study was carried out over a six-month period in selected public sector primary health care centers providing outpatient services to urban populations. A cross-sectional design was considered appropriate for estimating the prevalence of different nutritional status categories and dietary practices and for describing their distribution within the study population at a single point in time (11).
The study population consisted of adult patients attending outpatient departments for routine medical care. Individuals aged 18 years and above who were willing to participate were eligible for inclusion. Pregnant women, patients with severe acute illnesses, and individuals with medical conditions known to significantly affect body composition, such as advanced malignancy or chronic renal failure, were excluded to minimize measurement bias. Participants were recruited using a convenience sampling approach from eligible patients present during clinic hours. All participants were informed about the purpose and procedures of the study, and written informed consent was obtained prior to data collection in accordance with ethical research principles (12).
Data were collected using a structured interviewer-administered questionnaire developed based on previous nutrition and dietary assessment studies and adapted to the local context (13). The questionnaire captured sociodemographic characteristics, including age, gender, education level, and employment status, as well as dietary habits such as meal frequency, regularity of meals, daily intake of fruits and vegetables, frequency of consumption of fried and fast foods, and intake of sugar-sweetened beverages. Dietary habit variables were operationally defined prior to analysis, with frequent fast or fried food intake defined as consumption three or more times per week and regular fruit or vegetable intake defined as daily consumption (14).
Anthropometric measurements were obtained using standardized procedures to assess nutritional status. Body weight was measured to the nearest 0.1 kg using a calibrated digital weighing scale with participants wearing light clothing and no shoes, while height was measured to the nearest 0.1 cm using a portable stadiometer. Body mass index was calculated as weight in kilograms divided by height in meters squared (kg/m²) and categorized according to World Health Organization classification into underweight, normal weight, overweight, and obese categories (15). Measurements were taken by trained data collectors to ensure consistency and reliability.
To reduce information and recall bias, standardized instructions were provided, and data collectors were trained prior to the start of the study. Potential confounding variables such as age and gender were recorded to allow stratified analysis and appropriate interpretation of findings (16). The sample size of 240 participants was determined based on feasibility considerations and previous urban nutrition studies reporting comparable prevalence estimates, allowing adequate precision for descriptive assessment (17).
Data were coded, entered, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics were used to summarize participant characteristics, nutritional status categories, and dietary habits. Categorical variables were presented as frequencies and percentages, while continuous variables were summarized using means and standard deviations. Missing data were minimal and managed using complete-case analysis to maintain data integrity (18).
Ethical approval for the study was obtained from the relevant institutional ethics review committee prior to data collection. All procedures were conducted in accordance with the Declaration of Helsinki. Confidentiality and anonymity were ensured by using non-identifiable data collection forms and restricting access to the dataset to the research team. Standardized protocols for data collection, measurement, and data management were followed to ensure reproducibility and reliability of the study findings (19).

RESULTS

A total of 240 adult patients attending primary health care centers in Karachi were included in the study. Males constituted 52.1% of the participants (n = 125; 95% CI: 45.8–58.3), while females accounted for 47.9% (n = 115; 95% CI: 41.7–54.2). The age distribution showed that 36.7% of participants were between 18 and 30 years of age (n = 88; 95% CI: 30.8–42.9), 38.3% were aged 31–45 years (n = 92; 95% CI: 32.4–44.6), and 25.0% were older than 45 years (n = 60; 95% CI: 19.9–30.8), indicating a predominantly young to middle-aged study population (Table 1).
Assessment of nutritional status using body mass index revealed that 18.3% of participants were underweight (n = 44; 95% CI: 13.9–23.7), while 36.7% had normal weight (n = 88; 95% CI: 30.8–42.9). Overweight status was observed in 29.6% of participants (n = 71; 95% CI: 24.2–35.6), and 15.4% were classified as obese (n = 37; 95% CI: 11.4–20.5). Combined overweight and obesity accounted for 45.0% of the study population, reflecting a substantial burden of excess body weight among primary health care attendees (Table 2).

Analysis of dietary habits showed that irregular meal patterns were reported by 41.2% of participants (n = 99; 95% CI: 35.2–47.6). Regular daily fruit consumption was reported by only 37.5% of respondents (n = 90; 95% CI: 31.6–43.8), while daily vegetable intake was reported by 42.5% (n = 102; 95% CI: 36.4–48.8). Frequent consumption of fast or fried foods, defined as intake three or more times per week, was reported by 38.8% of participants (n = 93; 95% CI: 32.8–45.0). Additionally, daily intake of sugar-sweetened beverages was reported by 31.7% of respondents (n = 76; 95% CI: 26.1–37.8), indicating a high prevalence of energy-dense dietary behaviors within the study population (Table 3).

Table 1. Participant Characteristics (n = 240)

Variable	Category	n (%)	95% CI for %	p-value*
Gender	Male	125 (52.1)	45.8–58.3	—
	Female	115 (47.9)	41.7–54.2	—
Age group (years)	18–30	88 (36.7)	30.8–42.9	—
	31–45	92 (38.3)	32.4–44.6	—
	>45	60 (25.0)	19.9–30.8	—

Table 2. Nutritional Status Based on BMI (n = 240)

BMI category (WHO)	n (%)	95% CI for %	p-value*
Underweight	44 (18.3)	13.9–23.7	—
Normal weight	88 (36.7)	30.8–42.9	—
Overweight	71 (29.6)	24.2–35.6	—
Obese	37 (15.4)	11.4–20.5	—

Table 3. Dietary Habits of Participants (n = 240)

Dietary habit	n (%)	95% CI for %	p-value*
Irregular meal pattern	99 (41.2)	35.2–47.6	—
Daily fruit intake	90 (37.5)	31.6–43.8	—
Daily vegetable intake	102 (42.5)	36.4–48.8	—
Frequent fast/fried food intake†	93 (38.8)	32.8–45.0	—
Daily sugary beverage intake	76 (31.7)	26.1–37.8	—

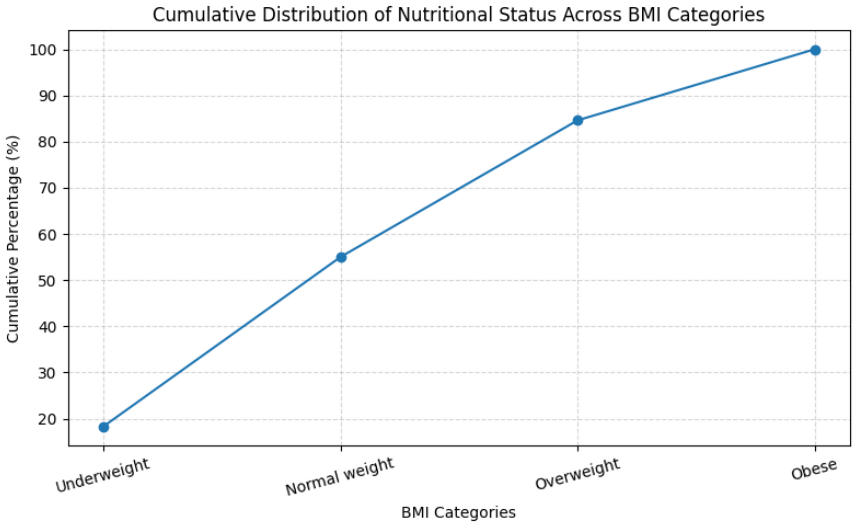

Figure 1 cumulative distribution of nutritional status across body mass index categories

The figure depicts the cumulative distribution of nutritional status across body mass index categories among patients attending primary health care centers in Karachi. Approximately 18.3% of participants were classified as underweight, and the cumulative proportion increased to 55.0% with the inclusion of individuals of normal weight. The cumulative prevalence rose sharply to 84.6% after accounting for overweight participants, indicating that more than four-fifths of the study population fell within the combined categories of underweight, normal weight, and overweight. The final cumulative value reached 100% with the inclusion of obese participants, who alone accounted for 15.4% of the population. The progressive slope across BMI categories highlights the substantial contribution of excess body weight to the overall nutritional profile, with overweight and obesity together

constituting nearly half of the study population, underscoring the coexistence of undernutrition and overnutrition within primary care attendees.

DISCUSSION

The present cross-sectional study provides insight into the nutritional status and dietary habits of patients attending primary health care centers in Karachi and demonstrates a clear coexistence of undernutrition and overnutrition within this urban population. Nearly half of the participants were classified as overweight or obese, while a substantial proportion remained underweight, reflecting the dual burden of malnutrition commonly observed in rapidly urbanizing low- and middle-income countries (20). These findings highlight the complex nutritional challenges faced by primary care populations in metropolitan settings.

The prevalence of overweight and obesity observed in this study is consistent with national and regional data indicating a rising burden of excess body weight in urban Pakistan (21). Urbanization, sedentary lifestyles, and increased availability of energy-dense, processed foods have been identified as key drivers of this trend (22). At the same time, the persistence of underweight individuals suggests ongoing issues related to food insecurity, socioeconomic inequality, and inadequate dietary diversity, even within urban environments (23). The simultaneous presence of these contrasting nutritional states underscores the need for integrated public health strategies addressing both ends of the malnutrition spectrum.

Dietary habit analysis revealed suboptimal patterns among a large proportion of participants, particularly low daily consumption of fruits and vegetables and a high frequency of fast and fried food intake. These findings align with previous studies reporting poor dietary quality and insufficient intake of micronutrient-rich foods among urban populations in Pakistan (24). Such dietary patterns are associated with increased risk of non-communicable diseases, including cardiovascular disease, diabetes, and obesity, and may partially explain the high prevalence of excess body weight observed in this study (25).

Irregular meal patterns were reported by more than two-fifths of participants, which has been linked in previous research to impaired metabolic regulation and unhealthy food choices (26). Additionally, frequent consumption of sugar-sweetened beverages and fast foods reflects the growing influence of Westernized dietary behaviors in urban settings. These behaviors are often reinforced by convenience, affordability, and aggressive marketing, particularly among working-age adults (27).

Primary health care centers offer a strategic platform for addressing these nutrition-related challenges through routine screening, counseling, and health education. The findings of this study emphasize the importance of integrating nutritional assessment into primary care services and strengthening the capacity of primary health care providers to deliver context-specific dietary guidance (28). Lifestyle counseling at the primary care level has been shown to improve dietary behaviors and support weight management when consistently implemented (29).

Several limitations of this study should be acknowledged. The cross-sectional design precludes causal inference between dietary habits and nutritional status. Convenience sampling limits generalizability beyond the selected primary health care centers, and reliance on self-reported dietary data may introduce recall bias. Despite these limitations, the study contributes valuable baseline data on nutritional status and dietary practices among primary care attendees in Karachi, addressing an important gap in the local literature (30).

Overall, the findings underscore the urgent need for comprehensive, primary care–based nutrition interventions that address both undernutrition and overnutrition. Future research employing longitudinal designs and analytical approaches is recommended to better understand causal pathways and to evaluate the effectiveness of targeted nutrition education and behavioral interventions within primary health care settings (31).

CONCLUSION

This study demonstrates that a substantial proportion of patients attending primary health care centres in Karachi exhibit suboptimal nutritional status and unhealthy dietary habits, reflecting a dual burden of undernutrition and overnutrition. Nearly half of the participants were classified as overweight or obese, while undernutrition remained prevalent, alongside dietary behaviours characterized by irregular meal patterns, low intake of fruits and vegetables, and frequent consumption of energy-dense foods. These findings highlight the need for integrated nutrition-focused strategies within primary health care settings. Routine nutritional screening, individualized dietary counselling, and community-based nutrition education should be strengthened to address both ends of the malnutrition spectrum. Given the cross-sectional design and sampling approach, further longitudinal and analytical studies are warranted to explore causal relationships and to assess the effectiveness of targeted interventions aimed at improving dietary behaviours and nutritional outcomes in urban primary care populations.

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