Food Choice Availability, Nutritional Status and Dietary Dissatisfaction in University Students

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Nutritional status and dietary satisfaction are critical determinants of university students' health and academic performance. However, limited access to healthy food choices on campuses may negatively influence students' dietary behaviors and overall well-being.This study aimed to examine the relationship between food choice availability, nutritional status, and dietary dissatisfaction among university students in Lahore, Pakistan. Specifically, it assessed how food access varies between day scholars and hostel residents and its impact on dietary outcomes. A correlational survey design was employed using a non-probability purposive sampling strategy. The sample comprised 201 university students (98 males, 103 females), aged 18 to 27 years (M = 23.18, SD = 0.50), from various universities in Lahore. Data were collected using a Demographic Information Sheet, Healthy Food Accessibility Scale (HFAS), Dietary Dissatisfaction Scale (DDSS), and Nutritional Assessment Questionnaire (NAQ). Statistical analyses included Pearson Product-Moment Correlation, Linear Regression, and Independent Sample t-tests.The findings revealed a significant positive correlation between dietary dissatisfaction and poor nutritional status. A negative association was found between healthy food availability and both dietary dissatisfaction and malnutrition. Key contributing factors included financial constraints, unhealthy eating habits, lack of nutritional awareness, and meal skipping. Hostel residents, students in government institutions, and female students reported higher levels of dietary dissatisfaction and reduced access to nutritious food options.The study highlights the pressing need for improved availability of healthy food choices on university campuses. Interventions such as nutrition education campaigns and affordable healthy meal plans are recommended to promote healthier eating patterns and enhance students' well-being.

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Introduction

Adequate dietary intake is a cornerstone of both physical and mental well-being, particularly during emerging adulthood a critical life stage marked by increased independence and the formation of lifelong health behaviors. University students, as young adults transitioning from adolescence, often face unique nutritional challenges influenced by shifting routines, academic stress, financial limitations, and a newfound autonomy in food choices. Despite their vulnerability, this population remains understudied compared to pediatric and geriatric groups, largely because the consequences of poor nutrition may not manifest immediately but can significantly impact long-term health outcomes.

In Pakistan, rapid urbanization, inflation, and changing food environments have affected access to nutritious food, especially for students in metropolitan areas like Lahore. While global research has explored dietary habits in university populations, limited empirical attention has been given to the contextual realities of Pakistani students, such as differences in access to healthy food between day scholars and hostel residents, or the influence of socio-economic status on dietary choices.

The Social Ecological Model (SEM) serves as a guiding framework for this study. SEM posits that health behaviors, including dietary practices, are shaped by interactions across multiple levels: individual (e.g., knowledge, attitudes), interpersonal (e.g., peer and family influence), organizational (e.g., university cafeteria policies), and community or environmental factors (e.g., food accessibility). Applying this model allows for a nuanced examination of how environmental and structural variables influence students' nutritional outcomes.

Previous studies highlight the complexity of students' eating behaviors. For example, research in the United States has linked limited food access and affordability to poor dietary habits, with food insecurity often compounded by unemployment, low education, and mental health

stressors (Coleman-Jensen et al., 2019). Among university populations, students frequently report inadequate intake of fruits and vegetables, often substituting them with energy-dense, nutrient-poor foods due to availability and convenience (Huang et al., 2003; Mikolajczyk et al., 2009).

Gender differences in dietary patterns have also been observed. Female students tend to exhibit more health-conscious eating behaviors, consuming more fruits, vegetables, and dairy products, whereas male students often consume higher amounts of fast food, sugary beverages, and meat products (Huang et al., 2003; Mikolajczyk et al., 2009). Additionally, stress and academic pressure are known to contribute to disordered eating patterns, including meal skipping and binge eating, which may further exacerbate nutritional deficiencies (Alizadeh & Ghabili, 2008).

Despite these insights, there remains a dearth of localized studies that investigate how food choice availability on campuses influences both nutritional status and dietary dissatisfaction. This study aims to bridge that gap by exploring the interplay between environmental food accessibility and student well-being within the Pakistani context. By examining these dynamics, the research seeks to inform policy-level interventions to promote healthier eating environments in universities.

University students represent a critical demographic for health promotion and disease prevention initiatives. As young adults navigate the transition to independent living, they often face challenges in maintaining balanced dietary habits due to academic stress, financial limitations, and lack of structured meal environments. Despite the importance of nutrition during this developmental phase, research indicates that this group remains largely overlooked in public health planning (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008).

This study focuses on three primary variables: food choice availability, nutritional status, and dietary dissatisfaction. Food choice availability refers to the accessibility and affordability of healthy food options in students' environments, particularly within university campuses and hostels. Nutritional status denotes the physiological condition of an individual as influenced by nutrient intake and utilization. Dietary

dissatisfaction reflects an individual's subjective dissatisfaction with their food quality, variety, and adequacy.

The World Health Organization (2021) identifies limited access to healthy food as a major contributor to lifestyle-related diseases such as obesity, diabetes, and cardiovascular conditions. Poor dietary choices— often a consequence of environmental and economic constraints—are linked with long-term health risks. Research by Powell, Durham, and Lawler (2019) emphasizes that food choices are frequently driven by routine decisions and availability, which are especially limited in institutional settings like university hostels.

International studies highlight a concerning pattern among university students, who commonly exhibit poor dietary practices, including meal skipping and inadequate consumption of fruits and vegetables (Lambert, Chivers, & Farringdon, 2019). Students living at home typically have greater access to home-cooked meals and family financial support, which increases the likelihood of healthy food consumption. Conversely, hostel students often rely on low-cost, energy-dense foods due to budgetary limitations and restricted options on campus (Lambert et al., 2019).

Gender differences in dietary behavior have also been reported. Females generally demonstrate more health-conscious food choices, while males show a tendency toward fast food and sugar-sweetened beverage consumption (Huang et al., 2003; Mikolajczyk, El Ansari, & Maxwell, 2009). Stress, time constraints, and lack of nutritional knowledge further contribute to unhealthy eating habits among both sexes (Alizadeh & Ghabili, 2008).

While international literature provides valuable insight, there is a notable gap in indigenous research on this topic. A study by Jafar et al. (2013) in Pakistan reported that youth dietary patterns are increasingly characterized by consumption of processed foods, low fruit and vegetable intake, and irregular meal timings. Another local study by Raza, Sultan, and Khuwaja (2019) found that Pakistani university students often face challenges accessing nutritious food on campus, particularly those from low-income backgrounds.

Furthermore, recent research conducted in Lahore universities
observed a significant association between financial instability and poor
nutritional outcomes, including weight fluctuations and low energy levels
(Ahmed, 2020). These findings suggest the urgent need to examine the role
of food choice availability in shaping nutritional status and dietary
satisfaction among Pakistani students.

This study, therefore, aims to explore the relationship between food
choice availability, nutritional status, and dietary dissatisfaction among
university students in Lahore, using a contextualized and theory-informed
framework. By incorporating both international and indigenous literature,
the study seeks to address a critical gap in public health research and offer
evidence-based recommendations for improving student well-being.

A shift from adequate nutrition to malnutrition has been observed
in Eastern and Central Europe, with emerging concerns regarding
nutritional restrictions among males due to limited and forced food
availability choices (Li et al., 2022). Similar trends have been documented
among university students, who often face constraints in food availability
that lead to unhealthy eating behaviors, such as skipping main meals and
relying heavily on snacks. In university food environments, the taste of
food, followed by its availability and price, are primary determinants of
students' food choices. Alarmingly, students may misperceive unhealthy
foods and beverages as healthy options due to lack of nutritional
awareness. The diet quality of university students is significantly
influenced by their living arrangements and socioeconomic status, with a
notable increase in consumption of salt, fat, and added sugars contributing
to poorer nutritional outcomes on campus (Li et al., 2022).

Dietary patterns, which reflect habitual food consumption, provide
more accurate insights into disease risk than analyses of isolated nutrients.
Research indicates that specific patterns of eating are directly associated
with disease progression in later life. For instance, type 2 diabetes is
strongly linked with obesity, which in turn is rooted in long-term unhealthy
dietary practices (Omage & Omuemu, 2018). The transition period from
adolescence to adulthood typically represented by university years—is
critical for the development of both health-promoting and disease-inducing

behaviors. Thus, university students remain a key population for interventions aimed at establishing healthy dietary habits.

Eating behavior is influenced by multiple factors, including food accessibility, individual preferences, and psychological relationships with food. This study explores the relationship between food availability, food choices, dietary dissatisfaction, and nutritional status among university students. Findings reveal that university students particularly male hostel residents are often compelled to consume unhealthy food due to a lack of healthy options, leading to significant dietary dissatisfaction. While responses from students across different regions showed general similarities, students from the North-East region reported the poorest dietary outcomes, underscoring regional disparities in food access. These findings highlight the urgent need for interventions aimed at improving dietary patterns and reducing nutritional inequalities among students from different geographical and socio-economic backgrounds.

A review of the literature supports the notion that the availability of healthy food options is directly linked to improved food choices, healthier eating habits, and the maintenance of a healthy body weight across various populations, including university students. Enhanced nutritional awareness, combined with access to nutritious food and supportive environments, has been shown to facilitate better dietary decisions. In a cross-sectional study conducted at Sultan Qaboos University, researchers assessed the availability of nutrition, eating behaviors, and dietary patterns among students (Ali, Noura, Sadiq, & Waly, 2020). The study randomly selected 120 participants (38 men and 82 women) from multiple colleges, excluding those enrolled in nutrition-related programs. The research instrument consisted of two sections: demographic and dietary information in Section I, and a 20-item questionnaire in Section II focused on food availability, preferences, and eating habits. Dietary intake was assessed using the validated Campus Nutrition Availability Index (CNAI). Results demonstrated that limited availability of healthy food contributes to poor eating behaviors and the development of unhealthy dietary preferences among university students.

Omage (2018) conducted a study to evaluate the eating habits and nutritional status of university students based on the availability of food

options. Utilizing a cross-sectional design, the study sampled 800 students and collected data through a structured questionnaire. The results revealed that more than half of the participants (n = 488) skipped breakfast, primarily due to the lack of access to healthy food options. Additionally, 608 students reported frequent snacking between meals, a pattern often linked with poor dietary habits. Regarding dietary diversity, 392 students demonstrated a high food variety score, while 212 exhibited a low variety score. Interestingly, male students scored higher on dietary diversity indices compared to females, indicating potential gender differences in dietary behaviors.

Similarly, Hilger and Loerbroks (2017) explored food consumption patterns and the barriers to healthy eating among university students through a cross-sectional internet-based survey involving 689 participants. The findings highlighted several key barriers to healthy eating, including academic workload, limited access to nutritious food options, and the high cost of meals at university cafeterias. Through cluster analysis, the study revealed that these challenges disproportionately affected specific subgroups of students, suggesting the need for targeted interventions to address the nutritional disparities within the student population.

Rationale/ Practical & Scientific Application

Malnutrition remains a persistent and alarming public health issue in Pakistan, with significant implications for young adults, particularly university students. According to the National Nutrition Survey of Pakistan (2018), approximately 37% of the population is food insecure, with high levels of micronutrient deficiencies among youth and young adults. While much of the national discourse has centered around maternal and child malnutrition, limited research exists on the nutritional status of university-going students, a group transitioning into independent adulthood and often responsible for making their own food choices for the first time. Existing literature reveals that dietary deprivation and limited access to nutritious food options on university campuses contribute significantly to poor eating behaviors among students. These behaviors such as frequent meal skipping, increased consumption of energy-dense and nutrient-poor foods, and reliance on snacks are often driven by

environmental, economic, and social constraints, including inadequate hostel food services, limited healthy choices in cafeterias, and lack of nutritional awareness. Despite evidence from international studies (e.g., Li et al., 2022; Omage & Omuemu, 2018), indigenous research on this issue remains sparse, particularly in terms of identifying the primary and secondary causes of malnutrition in university settings within Pakistan.

The consequences of malnutrition during this critical developmental stage are profound. Poor dietary habits and nutrient deficiencies have been linked to declines in cognitive function, reduced academic performance, low energy levels, increased susceptibility to illness, and poor long-term professional outcomes. These issues not only affect individual students but also have broader social and economic implications for national progress, as the youth are expected to serve as future representatives of the country on both national and international platforms. Therefore, this study is vital in filling existing research gaps by investigating the causes and consequences of malnutrition and dietary dissatisfaction among university students in Pakistan. By identifying both primary (e.g., food unavailability, financial constraints) and secondary (e.g., lack of nutritional awareness, unhealthy eating habits) contributing factors, the study aims to propose targeted, evidence-based solutions. The findings may inform campus health policies, nutrition education programs, and institutional reforms that support student well-being and performance. Ultimately, the study seeks to contribute to the development of a healthier, more productive, and economically empowered youth population in Pakistan.

Objectives

The present study aims to:

- Examine the relationship between the availability of healthy food choices, nutritional status and dietary dissatisfaction in university students.
- Investigate the predictive role of healthy food availability and malnutrition on dietary dissatisfaction in university students.
- Explore the influence of demographic factors (e.g., gender, residential status, type of university) on healthy food availability, nutritional status and dietary dissatisfaction.

Hypothesis

The research has the following hypotheses based on the above-mentioned literature review on assessment of nutritional status and dietary dissatisfaction of university students in relation to their food availabity choices.

- There will be a significant relationship between healthy food availability, nutritional status, and dietary dissatisfaction among university students.
- Healthy food availability and nutritional status will significantly predict levels of dietary dissatisfaction among university students.
- There will be significant differences in healthy food availability, nutritional status, and dietary dissatisfaction based on demographic factors such as gender, residential status (day scholar vs. hostel resident), and type of university (public vs. private).

Method

Research Design

It was a cross-sectional study to examine how young adults tend to report food availability, dietary dissatisfaction and nutritional status.

Sample

The participants included 200) full time students enrolled in public sector universities of Lahore. There were 98 boys and 102 girls with a mean age of (M = 23.18, SD = 0.50). Participants were recruited through online social media platforms, using Google forms.

Inclusion Criteria

Participants were included in the study based on the following criteria:

- Full time students attending public sector universities.
- Students with at least secondary or post-secondary education, capable of understanding and responding to English-language survey items.
- Students pursuing degrees in humanities, sciences and social sciences

Exclusion Criteria

- Individuals with self-reported psychological issues, including but not limited to eating disorders, depression, or anxiety.
- Individuals with chronic medical conditions that might interfere with dietary behaviors or psychological

assessments.
- Non-regular students, such as those enrolled in weekend-only programs.

Table 1.

Demographic Characteristic of Sample (N =200)

Variable	F	%
Gender		
Male	98	48%
Female	102	52%
Oral Supplement		
Yes	30	15%
No	170	184%
Smoking		
Yes	23	11%
No	177	188%
Income Level		
Lower (30k to 50k)	77	45%
Middle (50k to 1 lac)	54	20%
Upper (Above 1 lac)	68	35%
University Regular Student		
Government	80	40%
Private	120	60%
Residential Area		
Home	110	54%
Hostel	90	46%
Work Status		
Yes	110	54%
No	90	46%

	M	*SD*
Age (in years)	23.18	.50
Weight in kg	60.53	.35
Height in inches	5.75	3.55

Note, M= Mean; SD = Standard Deviation; f *= frequency; % = percentage*

Measurements

Demographic Information Sheet. Demographic sheet include age, gender, weight, height, education level, income level, city, residential area, supplement status and smoking status.

Healthy Food Accessibility Scale (HFAS) is designed to measure students' perceptions of the availability of healthy food options on university campuses. The HFAS consists of a series of 8 item statements regarding Availability of healthy food options, Convenience of accessing options, Affordability of healthy foods and Quality of food available to which respondents will indicate their level of agreement using a Likert scale through 5 point likert scale "1 Strongly disagree to 5 Strongly agree". To assess students' perceptions of the availability and accessibility of healthy food options on campus items includes *"There are enough healthy food options available on campus, Healthy food options are conveniently located, Healthy food options are affordable for students and I am satisfied with the quality of healthy food available on campus"* Nutrition specialist and researcher use this scale on different study and find Cronbach's alpha .85 high test-retest reliability and adequate concurrent validity (Tam et al, 2017).

Dietary Dis-satisfaction Scale (DDSS)

Dietary dis-satisfaction scale consist on 12 item with five point likert scale 1 "strongly agree" to 5 "strongly disagree". (James, 2018). It is a self – response inventory to measure how individual satisfy their food and why individual dissatisfy their dietary intake by measure lifestyle, income-level, media persuasion , family dynamic, preoccupation with busy schedule. Question "healthy food cost too much" , "tasteless food cause omit my lunch" , "busy schedule cause nutrition deprivation" are all measure satisfaction status. The D Sat scale measure 5 times during

1 year and once in online survey as well as factor analysis all are show high validity and reliability .76 of scale.

Nutritional Assessment Questionnaire (NAQ)

Nutritional Assessment Questionnaire (NAQ) is designed to evaluate dietary habits, nutritional status, and risk factors related to malnutrition. It is often tailored for specific populations, including university students. Nutritional Assessment Questionnaire (NAQ) scale consist on 12 item with five point likert scale 1 "strongly disagree" to 5 "strongly agree". Items to measure nutrition status include *"I eat fruits and vegetables at least five times a week. I consume whole grains (e.g., brown rice, whole wheat bread) regularly, I usually have breakfast before classes, I often skip meals due to a busy schedule. I have enough access to healthy food options on campus, Cost is a barrier for me when purchasing healthy foods, I believe my current diet is contributing to my overall health. I feel confident in making healthy food choices".* Study shows NAQ has high internal consistency, which was measured by using Cronbach's alpha and values above 0.70 test-retest reliability and scale has also adequate concurrent validity (Alissa & Ferns, 2016).

Procedure

Permission from the authors of the scales was sought to use the scales in the study. The purpose of the study and the nature of the tools/scales were explained in the questionnaire for respondents. Informed consent was obtained from participants prior to data collection and it was mentioned in the questionnaire for participants that their participation is completely voluntary and the confidentiality of identity and responses will be maintained in study. The responses were obtained on demographic information sheet, Healthy Food Accessibility Scale (HFAS), Dietary Dissatisfaction scale (DDSS) and Nutritional Assessment Questionnaire (NAQ).The participants had full right to leave at any time. After taking the consent form, questionnaires were added to the next section provided to participants whom they filled online. After completing the questionnaires, participants were thanked for their quality time by a thank you message in the next section. Pilot study with 30 participants was done prior to complete data collection. The reliability of the tools came out to be nearly perfect so the further data collection was continued. The response rate was

90% few questionnaires were discarded due to incomplete information and
not meet criteria.

Statistical Analysis

Initially, descriptive statistics were computed to summarize the
demographic characteristics and key variables of the study. To ensure the
reliability of the measurement instruments, Cronbach's alpha coefficients
were calculated. Following this, a series of inferential statistical analyses
were conducted. Pearson Product-Moment Correlation analysis was used
to examine the relationships among the main study variables. To explore
predictive relationships, linear regression analyses were performed.
Additionally, independent samples t-tests were conducted to compare
mean differences between two groups, and one-way Analysis of Variance
(ANOVA) was used to assess mean differences across more than two
groups based on selected demographic variables. A significance level of $p < .05$ was used for all statistical tests.

Ethical Considerations

The research study followed the ethical guidelines outlined by the
Institutional Review Board (IRB). Prior permission was obtained from
both the original author and the relevant institution where the study was
conducted. Participants were fully informed about the purpose,
significance, and procedures of the research. Informed consent was
obtained, and participation was entirely voluntary. Confidentiality of all
personal information was strictly maintained, and participants were given
the right to withdraw from the study at any stage without any
consequences. Furthermore, the study ensured that no physical, social, or
psychological harm would occur to the participants during their
involvement.

Results

Descriptive statistics, correlation coefficients, linear regression analysis were carried out and to analyze mean differences across diverse socio demographic t.test and Anova were performed.

Table 2

Descriptive Statistics and Reliability Coefficients for Study Variables (N=200)

Variable	K	M	SD	a	Potential	Actual
HFAS	8	11.34	3.78	.74	5-40	10-21
NS	12	39.65	6.44	.72	5-60	20-59
DDS	12	13.39	3.09	.70	5-60	15-35

Note. HFAS= Healthy Food Accessibility Scale, DDS = Dietary Dis-satisfaction Scale, NAQ = Nutritional Assessment Questionnaire, k= Num of item , M = Mean, SD = Standard deviation, α= Cronbach's-alpha *p < .05, **p < .01.

Table 2 showed Healthy Food Accessibility Scale has higher alpha reliability than other two study questionnaires'.

Table 3

Pearson Product Moment Correlation among Demographic and Study Variables (N=200)

Variable	1	2	3	4	5	6
Age	-	$.32^{**}$	$.34^{**}$	-.13**	-.37**	.46**
Weight	-	-	.01	-.48*	-.32*	.36**
Height	-	-	-	.26	-.22	-.10
HFA	-	-	-	-	$.78^{**}$	$-.56^{**}$
NS	-	-	-	-	-	.-86**
DDS	-	-	-	-	-	-

Note. HFAS= Healthy Food Accessibility Scale, DDS = Dietary Dis-satisfaction Scale, NAQ = Nutritional Assessment Questionnaire, *p< .05, level **p< .01,***p<.001.

As shown in table 3 Pearson products moment correlation was run to find relationship between demographic and study variables. Results indicate in demographics variables age, weight have significant correlation with study variables. Further, healthy food availability has significant positive correlation with nutritional status while negative correlation with dietary dis-satisfaction. Nutritional status significant negative correlation with Dietary dis-satisfaction.

Table 4

*Food Choices Availability, Nutritional status and Demographic
Variables Predicting Dietary dissatisfaction in University Students (N=
200)*

						95%CI	
Variables	Beta	SD	B	t	P	LL	UL
Constant	24.71	5.43		4.55	.000	14.00	35.42
Age	-.05	-.13	-.10	-.41	.03	- .21	-.32
Weight	.00	.04	.26	.56	.02	.07	.08
Height	-.10	-.68	-.01	-.15	.04	-1.45	-1.24
Living area	.30	.97	.28	.31	.02	1.61	2.22
HFA	-3.21	-.98	-.34	-3.25	.01	-1.26	-5.16
NS	-.11	-.14	-.56	-5.79	.00	-.17	-.41
F	7.50						
R^2	.47						

Note. HFAS= Healthy Food Accessibility Scale, DDS = Dietary Dis-satisfaction Scale, *p< .05, level **p<
.01,***p<.001.

   Tables 4 Enter method use to run the regression analysis.
Assumption was fulfilled and overall model was highly significant. Results
indicate in demographic variable age and height negative predictor of
dietary dissatisfaction while weight and living area (lower coder
hostelized) both positively predicted. However in study variable healthy
food choose availability and nutrition status both negatively predictor of
dietary dissatisfaction. The model explained 47% variance in dietary-
dissatisfaction

Table 5

*Gender Differences between Food Choice Availability, Nutritional
Status and Dietary-Dissatisfaction in University Students (N= 200)*

	Boys (n = 98)		Girls (n = 102)				95%CI		
Variable	M	SD	M	SD	t	p	LL	UL	Cohen's d
HFA	1.50	.50	1.58	.49	-1.17	.02	-.22	-.28	0.47
NS	13.28	2.75	13.52	3.39	.54	.05	.62	1.10	0.69
DDS	39.68	5.97	39.66	6.89	.01	.01	1.78	1.81	0.67

Note; HFAS= Healthy Food Accessibility Scale, DDS = Dietary Dis-satisfaction Scale, NAQ = Nutritional
Assessment Questionnaire, M= Mean , SD Stander deviation , CI= confidence interval, LL = lower limit, UL =
upper limit, *p< .05, level **p< .01,***p<.001.

Table 5 Equal variances were assumed for all study variables. Results shows Girls are significant higher mean in healthy food availability and nutritional status while boys has significant higher mean on dietary dis-satisfaction scale.

Table 6

Residential Area Differences between Food Choice Availability, Nutritional Status and Dietary-Dissatisfaction in University Students (N=200)

	Home (n = 110)		Hostel (n = 90)				95%CI		
Variable	**M**	**SD**	**M**	**SD**	**t**	**p**	**LL**	**UL**	**Cohen's d**
HFA	1.56	.50	1.49	.49	.79	.04	-.22	-.28	0.67
NS	1.76	.45	1.72	.42	.51	.02	-.10	-.18	0.38
DDS	39.34	6.29	39.74	7.06	.35	.03	.152	1.81	0.63

Note; HFAS= Healthy Food Accessibility Scale, DDS = Dietary Dis-satisfaction Scale, NAQ = Nutritional Assessment Questionnaire, M= Mean , SD Stander deviation , CI= confidence interval, LL = lower limit, UL = upper limit, *p< .05, level **p< .01,***p<.001.

Table 6 indicating equal variances were assumed for all variables. Results shows living at home (students) are significant higher mean in healthy food availability and nutritional status while hostelized has significant higher mean on dietary dis-satisfaction scale.

Table 7

One-way Anova Compare 3 Income level Groups Differences between Food Choice Availability, Nutritional Status and Dietary-Dissatisfaction in University Students (N=200)

	Income Level							
	30k to 50k		51k to 1lac		above 1lac			
Variables	M	SD	*M*	*SD*	M	SD	F (2,198)	π^2
HFA	1.54	.50	1.53	.50	1.59	.50	.13*	0.26
NS	1.62	.49	1.77	.42	1.79	.41	1.51**	0.45
DDS	41.15	7.31	39.08	5.96	14.17	4.86	2.09*	0.60

Note; HFAS= Healthy Food Accessibility Scale, DDS = Dietary Dis-satisfaction Scale, NAQ = Nutritional Assessment Questionnaire, M= Mean , SD Stander deviation , *p< .05, level **p< .01,***p<.001.

Table 8

Post hoc test comparison for 3 income group (N=200)

Variable		Compare Variables	Mean Differences
HFA	30k to 50k	51k to 1lac	-.24
		above 1lac	-.52[*]
	51k to 1lac	30k to 50k	.24
		above 1lac	-.27
	above 1lac	30k to 50k	-.52[*]
		51k to 1lac	-.27
NS	30k to 50k	51k to 1lac	-.45
		above 1lac	-.33[*]
	51k to 1lac	30k to 50k	.43
		above 1lac	-.07
	above 1lac	30k to 50k	.35[*]
		51k to 1lac	.08
DDS	30k to 50k	51k to 1lac	.42
		above 1lac	.33[*]
	51k to 1lac	30k to 50k	-.42
		above 1lac	.09
	above 1lac	30k to 50k	-.31[*]
		51k to 1lac	-.09

Note; HFAS= Healthy Food Accessibility Scale, DDS = Dietary Dis-satisfaction Scale, NAQ = Nutritional Assessment Questionnaire* p< .05, **p<.01, ***p<.001.

Table8 Assumption is fulfilled and ANOVA is significant for all study variables. Partial Eta squared is 0.26, 0.60 and 0.45 for study variables. Post hoc indicated that lower (30k to 50k) and upper level (above 1lac) individuals have significant mean differences and upper (above 1lac) people have more healthy food availability and nutrition status in comparison to lower income (30k to 50k) group while lower group (30k to 50k) have more dietary dissatisfaction than upper group (above 1lac).

Discussion

The present research explored the relationship between healthy food availability, nutrition status, and dietary dissatisfaction among university students. Specifically, the predictive effects of dietary dissatisfaction on perceptions of healthy food availability and nutrition status were examined. In addition, the study investigated differences in these variables based on gender, residential area, and income level.

Previous research supports the current findings. For instance, Van den Berg (2012) conducted a cross-sectional study on the nutritional status of university students in the northern region. The sample consisted of 400 students, with an equal distribution of 200 male and 200 female participants. Data were collected using a standardized questionnaire. The study revealed that environmental, economic, social, and psychological factors significantly influenced students' nutritional outcomes. Limited resources and lower educational levels were associated with unhealthy dietary patterns. Furthermore, peer influence and environmental constraints particularly the lack of healthy food availability were found to negatively affect students' dietary choices. These influences contributed to poor nutrition, which in turn impaired various aspects of students' lives, including their social functioning, academic performance, professional productivity, and personal well-being. (Ahmed & Hussain, 2018)

Sajwani and Shoukat (2016) examined the daily routines, dietary profiles, and food availability influencing the eating behaviors of medical students. A total of 300 participants were included in the study. The results provided evidence that imbalanced diets and maladaptive food choices were predicted by the availability of food options and had a significant impact on students' levels of physical activity. Female students were found to be more concerned about the consumption of oily foods compared to male students. This concern was linked to increased Body Mass Index (BMI) and a higher risk of obesity-related health issues among female students. The study recommended targeted seminars and educational programs promoting healthy eating habits and nutritional awareness as strategies to prevent diet-related illnesses and reduce dietary dissatisfaction among university students.

Cornil and Chandon (2020) investigated the eating behaviors of university students using data collected through electronic media and web-based surveys. This correlational study explored the association between eating habits and levels of life satisfaction. The assessment of eating behavior included 14 different food categories. Findings indicated that students who consumed healthier food options such as fruits and vegetables reported higher levels of satisfaction and well-being compared to those who frequently consumed snacks and junk food. Students with healthier eating patterns also scored higher on measures of eating-related happiness. In contrast, those with a preference for unhealthy foods reported lower satisfaction and were more likely to experience negative emotions related to their dietary choices. Notably, female students were more likely than males to engage in healthy eating behaviors, and they reported greater happiness and satisfaction with their body weight and overall lifestyle.

Salameh et al. (2014) conducted a comprehensive survey involving 3,384 university students, utilizing a questionnaire tailored to assess dietary patterns across different age groups, genders, and student backgrounds including domestic, international, and working students. The analysis identified three primary dietary patterns: vegetarian, mixed, and westernized. The results revealed that female students were more likely to adopt a vegetarian dietary pattern, often motivated by concerns about body image and weight management. In contrast, male students tended to follow a westernized dietary lifestyle, characterized by higher intake of fast food and processed items. The adoption of vegetarian diets among females was linked to a heightened concern over obesity; however, it also raised concerns about potential nutritional deficiencies and increased dietary dissatisfaction.

Leung et al. (2018) aimed to measure the extent and severity of compromised dietary intake and food availability among home-based and hostel-residing students attending a metropolitan university. The findings revealed that students living in hostels were more vulnerable to dietary dissatisfaction due to several factors, including low financial resources, limited food variety, unhealthy food choices, and frequent meal skipping. These risk factors were found to significantly predict compromised dietary intake. The study emphasized that hostelized students often face greater challenges related to time management, budgeting, food accessibility, and organization of meals, all of which contribute to poor nutritional habits and decreased well-being. A t-test analysis was conducted to examine

differences between home-based and hostel-residing students. Results showed that hostel students experienced significantly more issues related to time constraints, financial limitations, food availability, and food quality, all of which were associated with increased levels of nutritional deprivation and dissatisfaction compared to home-based students.

These findings are further supported by Afsheen and Nawaz (2013), who assessed the nutritional status of 200 hostel-living and non-hostel university students in Sindh, Pakistan. Physiological assessments indicated that hostel-residing students had lower levels of sanguine fluids, glycogen, and protein. The researchers concluded that students living away from home tend to be less concerned about maintaining a healthy and balanced diet due to limited support systems and self-reliance, which ultimately leads to malnutrition and health-related challenges.

Gaines, Robb, Knol, and Sickler (2014) examined the eating behaviors and dietary satisfaction of 557 undergraduate students, exploring the associated risk factors for inadequate food intake. Data were collected using a dietary satisfaction and eating behavior questionnaire, alongside demographic variables. Although the online response rate was relatively low (6.7%), physical administration of the questionnaire yielded a response rate exceeding 70%, ensuring an adequate sample for analysis. The findings indicated that food security was significantly associated with food resource adequacy and financial stability. In particular, students from developing countries in Asia, who predominantly come from low- or middle-income households, were found to be especially vulnerable to poor dietary outcomes. Limited access to financial and food-related resources was identified as a primary contributor to nutritional deficiencies and unbalanced diets. These deficiencies, in turn, negatively impacted students' cognitive functioning, academic performance, physical activity, and overall psychological and physical development. The study further revealed that students with low dietary satisfaction scores demonstrated maladaptive eating behaviors, often shaped by external socio-economic factors.

Gallegos, Ramsey, and Ong (2014) emphasized that socioeconomic status is a critical determinant of health across both developed and developing nations. While national food supply might be

sufficient at the macro level, populations with lower income levels continue to experience food insecurity. The study highlighted that individuals from low-income households are disproportionately affected by poverty-related barriers such as unemployment, limited access to affordable food, low educational attainment, mental and physical health issues within the household, and substance abuse. These factors collectively contribute to a 60% higher prevalence of compromised dietary intake and food insecurity among socioeconomically disadvantaged groups.

Complementing these findings, Hughes, Serebryanikova, Donaldson, and Leveritt (2011) conducted a cross-sectional study involving 399 university students to assess the distribution and severity of food insecurity in higher education settings. The results revealed that approximately 25% of the student population experienced food insecurity, a rate nearly five times higher than that of the general population. Alarmingly, nearly 80% of students reported that food insecurity negatively impacted their academic performance. The study identified low income and dependency on government assistance as the primary contributing factors, underlining the heightened vulnerability of university students to nutritional and educational disadvantages linked to food insecurity.

Conclusion

The present study demonstrated a significant positive association between limited access to healthy food and the prevalence of nutritional deficiencies, health complications, and dietary dissatisfaction among university students. Notably, hostel-residing students from lower socioeconomic backgrounds characterized by limited financial resources, frequent meal skipping, restricted dietary variety, and unbalanced nutrition were found to be at greater risk of malnutrition and obesity compared to their home-based counterparts. This issue holds considerable importance, as the affected population represents the emerging young workforce at both national and international levels, making it imperative to address these challenges proactively.

To effectively tackle this problem, it is crucial to identify both primary and secondary contributing factors, including socioeconomic constraints and behavioral patterns. Comprehensive interventions aimed at improving food availability and promoting nutritional education within universities are essential. Implementing targeted awareness campaigns that encourage healthy eating habits can significantly enhance students' well-being and academic performance. Ultimately, such efforts will contribute to the development of a healthier, more productive generation, fostering positive social and economic progress for the nation.

Limitation

- Sample Limitations: The study was conducted only in Lahore, limiting the generalizability of results to other Pakistani regions with different cultural and socioeconomic contexts.
- Self-report Bias: Reliance on self-reported data increases the risk of social desirability bias affecting accuracy.

Suggestions

- Face-to-face data collection can improve accuracy but requires more time and resources.
- Longitudinal studies offer causal insights but need longer time and sustained participation.
- Qualitative inquiries provide deeper understanding but are time-consuming and need expertise.
- Sampling from multiple regions enhances generalizability but increases logistical complexity.
- Shorter questionnaires reduce fatigue but may limit detailed information.
- Mixed-methods approaches capture complexity but require more resources and skills.
- Including additional variables broadens understanding but complicates study design.

Implications

- The study highlights the importance of access to healthy and balanced diets for university students to maintain their well-being.
- Young adults, especially students, are vulnerable to nutritional problems, including both under nutrition and obesity.
- Nutritional issues negatively impact students' physical health, academic performance, and quality of life.

- Universities should prioritize nutrition education and awareness campaigns to promote healthy eating habits on campus.
- Improving the availability and affordability of nutritious food options within universities is essential.
- Creating a supportive environment for healthy dietary choices can reduce nutrition-related health risks among students.
- Promoting healthy eating behaviors contributes to better academic success, physical health, and future productivity of students.

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