



Role of Health Literacy in Shaping Dietary Patterns of University Students

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Abstract

This study examined how well university students understand health information and its role in shaping dietary patterns. The researchers used a mixed-method approach for the study. The researchers selected students enrolled in the BS programs in the semesters five, six, and seven. The researchers administered a questionnaire to measure health literacy and conducted interviews to identify dietary patterns of the students. The researchers surveyed a total sample of 172 respondents for the study and then randomly conducted interviews of the five students to identify their dietary patterns, including meal frequency, consistency, and hydration. The analysis of the data showed that students possess reasonable level of health literacy in comprehending health information, in making their lifestyle choices, communicating and identifying health care services, and critically evaluating the information. However, students' eating habits appeared to be inconsistent and their meal patterns varied due to educational workload, study stress, becoming used to or habit, insufficient time, financial constraints and issues of the quality of food in maintaining a balanced meal/ diet.

Keywords: *Dietary Patterns, Health Literacy, Lifestyle Choices, Eating Habits, Quality of Food*



Introduction

Good health is a blessing and maintaining it is an important responsibility of the individual. Good health enables an individual to assume his/ her daily life activities effectively. University students are in a growing stage of their lives and hence they need more to maintain their good health in taking on their academic work and other daily life activities. University life is transformative for students because it is a dynamic stage and adds new experiences all the time. At this stage, students need to be more responsible, capable of performing tasks independently, solely carrying out their academic activities and finally leave to continue their career as professionals (Steinberg, 2015). Therefore, they need good health to do all this. However, traditionally, at home some inconsistencies (including frequency, timing and quality of food) in their eating habits are generally observed. Similarly, their food choices are influenced by their mood(s), social environment, peer's motivation, convenience, cost and availability of food, resources, time, exam, study hours.

As socially and psychologically they are so developed. They are mature to decide and manage food(s) of their choice(s). Hence, the need of health literacy becomes evident as it influences the dietary habits of students. Dietary habits developed at this stage have lasting impacts. During this time, poor food choices can lead to vital nutritional deficits, weight gain or loss, and health issues. So, health literacy is essential in helping students to choose a dietary pattern for optimal health and wellbeing. Moreover, it is specific to both context and content i.e. health literacy in one environment or concerning a particular health decision will differ from that in another. (Smith, Nutbeam & McCaffery, 2013).

Literature Review

The quality of diet and dietary patterns of students in Pakistan need to be improved particularly for students for health promotion and illness prevention. Improving healthcare literacy leads towards a healthy lifestyle and impacts on health and welfare (Varga, Rafay Ali Sabzwari & Vargova, 2017) of students. Different factors including age, gender, the number of semesters, the type of study, parental education and socioeconomic level appear to affect health and level of health literacy [of students] in Pakistan (Kuhn, Bachert, Hildebrand, Kunkel, Reitermayer, Wasche & Woll, 2022). Health literacy is necessary to prevent illness and promote health and wellbeing through a healthy life style (Amoah, 2018).



Health literacy (HL) is identified by Paakkari et al. (2020) as an important determinant of health and wellbeing. The more the health literacy, the more people are healthy and overcome their health-related inequalities. It is an individual's ability to find, appraise, and understand basic health information so they can make health-related decisions for their benefits (World Health Organization, 2012). The European Health Literacy Consortium (2020) defines health literacy as one's ability to acquire and comprehend knowledge and information in order to preserve and improve health in a way that benefits both the individual and the system. Paakkari, Torppa, Mazur, Boberova, Sudeck, Kalman, and Paakkari (2020) identify health literacy (HL) as a substantial factor to address the health inequalities. According to the Healthy People 2030 initiative of the United States Department of Health and Human Services (HHS), health literacy is an individual's ability to learn, locate, and understand basic health information so they can make health-related decisions that will benefit them.

In this backdrop, Wang and Shahzad (2022) asserted that health literacy impacts on the dietary patterns [of university students]. Poor nutritional patterns correlate with poor nutritional literacy, whereas, the more health-conscious dietary practices appear to be associated with adequate diet information/ literacy. People with high level of health literacy often tend to consume more fruits and vegetables as compared to their counterparts having low level of health literacy (Oberne, Vamos, Wright, Wang & Daley, 2020).

Likewise, A cross-sectional study suggested to applying health related knowledge to diet [selection and choice] (Abreu, Hernando, Goulão, Pinto, Branco, Cerqueira & Sousa, 2023). Dietary patterns consider the complex relationships among distinct meal elements within the context of a balanced diet (Tapsell, Neale, Satija & Hu, 2016).

A study by Ayaz-Alkaya and Kulakci-Altintas (2021) revealed a positive correlation between health literacy and health, diet, workout behavior, and dietary patterns among Turkish school children in classes 6 to 8.

Despite their awareness of health risks, students still struggle to adopt proper food selection behaviors. Decisions before taking meals are very important, as some students have poor dietary patterns. As a result, eating inorganic food weakens the immunity of today's youth, making them more susceptible to disease. Secondly, the researcher observed that some students chose a



balanced diet while others took quick meals, especially in the educated sector (university); thus, the researchers aimed to investigate the role of health literacy in shaping university students' dietary patterns.

Objectives of Study

Objectives of the study were

- (a) to assess the health literacy level of university students; and
- (b) to investigate the role of health literacy in shaping dietary patterns of university students.

Research Methodology

This research evaluated the role of health literacy in shaping the dietary patterns of university students through a mixed-methods approach. The researchers used a self-developed questionnaire and an interview schedule as research tools to collect data. The questionnaire comprised of four clusters, each containing 24 closed-ended items, such as understanding health information, making healthy lifestyle choices, communicating and accessing healthcare services, and critically evaluating health information.

All items were based on a 5-Point Likert scale. The researchers developed an interview schedule with semi-structured questions that focused on meal type, frequency, consistency, and hydration, allowing students to cross-verify the authenticity of their responses. The population of the study consisted on Bachelor Studies (BS) students at the Islamia University of Bahawalpur. The sample comprised of 172 randomly selected students for a questionnaire, and 5 students volunteered themselves for interviews. The researchers entered the collected data into an SPSS 27.0 sheet and evaluated frequencies and percentages to described the role of health literacy in shaping dietary patterns of university students.

The study qualitatively examined the dietary data from student interviews. Comparison of male and female about health literacy in shaping dietary patterns of university students was computed by using inferential statistics in table-5.



Table-1
Students' Opinions about the Understanding Health Information

Sr. No.	Statement	Option	Excellent	Good	Average	Below average	Poor
1	Ability to comprehend health related information.	<i>f</i>	67	64	35	4	2
		%	39.0	37.2	20.3	2.3	1.2
2	Ability to understand medical terminology used in health guides and research.	<i>f</i>	51	73	39	8	1
		%	29.7	42.4	22.7	4.7	.6
3	Ability to interpret health-related statistics graphs and charts effectively.	<i>f</i>	30	54	51	32	5
		%	17.4	31.4	29.7	18.6	2.9
4	Ability to use online resources to gather health information.	<i>f</i>	70	67	25	7	3
		%	40.7	39.0	14.5	4.1	1.7
5	Ability to follow instructions provided for managing my health.	<i>f</i>	73	57	31	8	3
		%	42.4	33.1	18.0	4.7	1.7
Average			33.84	36.62	21.04	6.88	1.62

Table-1 shows students' ability to comprehend health knowledge comprehension ratings for five statements. Understanding health information, 39% rated it as excellent. Similarly, 42.4% of the respondents rated their ability to understand medical terms in health guidelines and research as good. Likewise, 31.4% of the respondents rated as good, the ability to interpret health-related statistics, graphs, and charts effectively, whereas 40.7% rated it excellent in their ability to use online resources to gather health information. Even so, 42.4% rated their understanding of health information as excellent in terms of their ability to follow instructions provided for managing their health.

Table-2
Students' Opinions about the Healthy Lifestyle Choices

Sr. No.	Statement	Option	Excellent	Good	Average	Below average	Poor
6	Ability to choose healthy and nutritious meals from the options.	<i>f</i>	58	75	29	8	2
		%	33.7	43.6	16.9	4.7	1.2
7	Understanding of the importance of regular physical activity for maintaining good health.	<i>f</i>	87	51	19	10	5
		%	50.6	29.7	11.0	5.8	2.9
8	Understanding of proper water intake for hydration.	<i>f</i>	93	44	23	8	4
		%	54.1	25.6	13.4	4.7	2.3
9	Understanding how to dress appropriately for different weather conditions and activities.	<i>f</i>	85	51	25	8	3
		%	49.4	29.7	14.5	4.7	1.7
10	Awareness of the risks associated with sharing (Cloths, jewelries etc).	<i>f</i>	67	51	37	10	7
		%	39.0	29.7	21.5	5.8	4.1



11	I prioritize adequate sleep as part of a healthy lifestyle.	<i>f</i>	80	48	30	11	3
		%	46.5	27.9	17.4	6.4	1.7
12	Ability to maintain a healthy balance between my academic workload and other aspects of my life (social activities, exercise, etc.).	<i>f</i>	60	61	34	11	6
		%	34.9	35.5	19.8	6.4	3.5
13	Utilization of relaxing techniques effectively to manage stress and anxiety.	<i>f</i>	54	50	48	16	4
		%	31.4	29.1	27.9	9.3	2.3
Average			42.45	31.35	17.8	5.97	2.46

Table-2 presents students' opinions on their ability to understand their healthy lifestyle choices across eight different statements or areas of lifestyle and health concern. It demonstrates that 43.6% and 33.7% of the students rated their ability to choose the healthy and nutritious meals from the given options (if given) to be good and excellent, respectively. Similarly, 50.6% of the students were of the view that they have excellent understanding of the importance of regular physical activity for maintaining good health, whereas 29.7% reported it to be good. The analysis further shows that 54.1% and 25.6% of the respondents/students were of the opinion that they have the ability to be excellent and good, respectively, in understanding proper water intake for hydration. Even so, 49.4% and 29.7% of the students rated their ability to understand how to dress appropriately for different weather conditions and activities. Likewise, 39% of the respondents were of the view that they have excellent awareness of the risks associated with sharing (clothes, jewelry, etc.), and 29.7% rated it to be good. However, 46.5% and 27.9% of the students reported their ability to be excellent and good respective in prioritizing adequate sleep as part of a healthy lifestyle. The analysis shows that 35% reported it to be excellent and 35.5% reported it good in maintaining a healthy balance between my academic workload and other aspects of my life (social activities, exercise, etc.). However, 31.4% of the students were of the view that they are excellent in the utilization of relaxing techniques effectively to manage stress and anxiety, whereas 29.1% of the respondents reported their ability to be good.

Table-3
 Students' Opinions about the Communication and Accessing Healthcare Services

Sr. No.	Statement	Option	Excellent	Good	Average	Below average	Poor
14	Ability to navigate the healthcare system to meet my health needs.	<i>f</i>	63	54	50	3	2
		%	36.6	31.4	29.1	1.7	1.2
15	Ability to communicate my health concerns to healthcare professionals	<i>f</i>	69	54	31	14	4
		%	40.1	31.4	18.0	8.1	2.3
16		<i>f</i>	39	61	43	18	11



	Familiarity with the healthcare services available on campus.	%	22.7	35.5	25.0	10.5	6.4
17	Ability to discuss my health history and concerns with healthcare professionals.	<i>f</i>	53	68	29	17	5
		%	30.8	39.5	16.9	9.9	2.9
18	Awareness of the process for obtaining prescriptions and medications on campus	<i>f</i>	45	57	40	20	10
		%	26.2	33.1	23.3	11.6	5.8
19	Prioritize preventive healthcare measures (e.g., regular checkups, vaccinations, and screenings).	<i>f</i>	44	53	28	25	22
		%	25.6	30.8	16.3	14.5	12.8
20	Ability to seek clarification if I don't understand information provided by healthcare providers.	<i>f</i>	54	60	37	15	6
		%	31.4	34.9	21.5	8.7	3.5
Average			30.48	33.8	21.44	9.28	4.98

Table-3 presents the respondents' opinions about communication and accessing healthcare services, as well as their perceptions and evaluations of communication skills in these areas. The analysis shows that 36.6% of students were of the opinion that they are excellent at navigating the healthcare system to meet my health needs, and 31.4% were good at doing so. Similarly, 40.1% of the students revealed that they are excellent at communicating their health concerns to healthcare professionals, whereas 31.4% affirmed that they are good at communicating with their health professionals regarding their health issues. The analysis shows that 35.5% and 22.7% of the respondents/students were of the opinion that they have familiarity with the healthcare services available on campus, good and excellent, respectively. Similarly, 39.5% and 30.8% of the students reported that they discuss their health history and concerns with healthcare professionals in a good and excellent way, respectively. The analysis shows that 33.1% of students were of the view that they are good at having awareness of the process for obtaining prescriptions and medications on campus, whereas 26.2% regarded themselves as excellent in this regard. Similarly, 30.8% and 25.6% of the students reported that they prioritize preventive healthcare measures (e.g., regular checkups, vaccinations, and screenings) in a good and excellent way, respectively. Likewise, 34.9% and 31.4% of the students rated their ability to be good and excellent, respectively, in seeking clarification if they don't understand the information provided by their healthcare providers.

Table-4
Students' Opinions of the Students about the Critical Evaluation of Health Information

Sr. No.	Statement	Option	Excellent	Good	Average	Below average	Poor
21	Ability to evaluate the reliability of health information from various sources	<i>f</i>	58	67	31	14	2
		%	33.7	39.0	18.0	8.1	1.2
22		<i>f</i>	38	71	51	7	5



	Ability to distinguish between evidence-based information and personal anecdotes in health discussions	%	22.1	41.3	29.7	4.1	2.9
23	Ability to make health-related decisions by checking validity from multiple sources	f	62	58	35	9	8
		%	36.0	33.7	20.3	5.2	4.7
24	Cautious about accepting health information without verifying its credibility	f	47	55	46	16	8
		%	27.3	32.0	26.7	9.3	4.7
Average			29.77	36.5	23.67	6.67	3.37

Table 4 shows that 39% and 33.7% of students reported their ability to be good and excellent in evaluating the reliability of health information from various sources. Similarly, 41.3% and 22.1% of the students were of the view that they are good and excellent, respectively, regarding their ability to distinguish between evidence-based information and personal anecdotes in health discussions. Likewise, 36% of the students affirmed that they have excellent ability to make health-related decisions by checking validity from multiple sources, whereas 33.7% of the students rated their ability to be good in this regard. Similarly, 32% and 27.3% of the students were of the opinion that they are cautious about accepting health information without verifying its credibility in a good and excellent way.

Table-5

Comparison of male and female about health literacy in shaping dietary patterns of university students

	Gender	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
Understanding Health Information	Male	100	10.31	2.646	.265	.118	.906
	Female	72	10.26	2.362	.278		
Healthy Lifestyle Choices	Male	98	15.30	5.600	.566	-.376	.707
	Female	72	15.60	4.487	.529		
Communication And Accessing Healthcare Services	Male	96	15.02	5.514	.563	-2.055	.042
	Female	69	16.77	5.208	.627		
Critical Evaluation of Health Information	Male	96	8.31	3.113	.318	-1.768	.079
	Female	70	9.14	2.809	.336		

Table-5 compares the perceptions of female and male students regarding various aspects of health literacy in shaping dietary patterns of university students. The T-test shows no statistically significant difference in three factors gender-wise ($p > 0.05$), i.e., understanding health information, healthy lifestyle choices, and critical evaluation of health information about understanding health information, but females scored higher in communication and accessing healthcare services ($p = 0.042$).



Analysis of Qualitative Data

Thematic Analysis of Dietary Patterns of University Students

In order to achieve the second objective (to investigate the role of health literacy in shaping dietary patterns of university students), the researcher observed the dietary patterns of university students and randomly selected 5 participants for the interview. The researcher transcribed interviews using Braun & Clarke's six-phase framework for thematic analysis, starting with data familiarization, generating initial codes, searching for themes, reviewing, defining, and writing up. Health literacy influences students' dietary patterns, but challenges persist in converting knowledge into actions. Factors like meal type, frequency, and water intake influence these patterns, as students' interviews reveal. Major themes emerge from the data.

Different Food Preferences and Choice

When students were asked about health literacy they showed awareness about it and understands the importance of balanced diet beneficial for health. Despite this fact researcher found students' knowledge is not reflecting in behaviors although they are health literate but still unable to make food choices accurate and diversity of food choices were highlighted. Inconsistent behavior were observed as responded by interviewee due to social setting, taste preferences, convenience application of health information, the variability in meal timing, and the preferences influenced by knowledge and external factors, As quoted by interviewee-2 in her interview.

"By eating chocolate I feel good and sometimes chips make me happy I fulfill my appetite by these things."

"I typically eat two meals a day: breakfast and dinner. My eating schedule varies depending on my daily activities and university commitments. Breakfast is often skipped on busy weekdays but enjoyed chapatti with qeema and salad around noon on weekends. Dinner timing is flexible based on my schedule. I also have one or two snacks during the day"

Those students who have good health literacy they skip a meal intentionally as concluded by interviewee-3:

"I am very health conscious. Just recently because of acne so I avoid taking chips, samosas like snacks and minimize oily foods. Secondly I am putting on weight in hostel so I skip a meal intentionally to make myself fit".

In the same way interviewee-4 expressed his views regarding factor influence food choice. *"Cravings and mood swings drive students to choose comfort foods, often leading to unhealthy eating patterns"*



"Nothing special, whatever food, which is tasty and then any sweet dish. I prefer easily available and try new deals at restaurant, I love enjoying different flavors of food. I eat food that looks appealing at the moment" this clearly showed lack of health literacy that hinders him to select food by its appearance without acknowledging its nutritional benefits".

"Occasionally I do breakfast you can say 2 times in a week otherwise in summer I regularly take lasii when I awake. I feel appetite after 2 pm" interviewee-1.

"Yes any junk food sometimes burger sometime steak, spaghetti, macronie pasta or sometimes shawarma I take etc." interviewee-1. *"Usually 3, 4 times in a week I prefer rice because I like it very much"* (Interviewee-3)

Social and Environmental Factors

Social influences such as friends, events, and reviews given by customers significantly affect food choices as said by interviewee-4.

"I do visit social media food pages and see the reviews given by customers so those food items whose comments and reviews are good automatically that compel me to try that food .and yes it happened I tried so many dishes by shared experiences of peoples"

Inconsistent Meal Patterns and Timing

Skipping meal is commonly observed by researcher in interviews student reported in interview

"Sorry I am habitual of late sleep. In routine i awake at my campus time for class so usually I skip breakfast"

"Honestly, I don't plan meals. I usually eat whatever's convenient, so I eat randomly or miss meals" interviewee-2.

"I am putting on weight in hostel so I skip a meal intentionally to make myself fit" responded by interviewee-3

"I solely have to control oil due to high cholesterol so I skip breakfast parathas in the morning etc. instead of making the whole meal oil free for family" interviewee-1

"At dinner I take rice biryani" interviewee-1

"I am worried about my home tasks and assignments in this semester system I find a way to get everything done in limited time so i compromise on meals and skip it" interviewee 3.

Thus, students have inconsistent meal timing due to busy schedules, word load and academic stress. They typically take two meals in day and sometimes stick to only one the timing of meal also shows inconsistencies.

Hydration and Drinking Habits

Water Intake

Researchers observation showed Moderate daily water consumption, typically aiming for 8 glasses is commonly seen in all interviews



Milk Consumption

Majority of the students who were observed do not take milk regularly instead a preference for other beverages like lassi, coke, sharbat bazuri etc.

Barriers to Healthy Eating

Respondents showed time constraint, financial issues and quality issues in adopting a balance diet.

"I think I don't have a good control on myself to stop myself from unhealthy junk items. In fact eating outdoor food products gives me pleasure and satisfaction" Interviewee 5

"Yes you know now a days fruits are so expensive even though I like it and know the nutritional benefits of it but I cannot afford their prices. Secondly at university there is limited access to healthy food most of the food quality is bad and they mix the previous food with new so I don't like it. All is unhygienic and time is limited so couldn't go outside to have healthy food" interviewee-4

Barriers Identified by Interviews

Time Constraints

"Busy schedules and university commitments hinder consistent eating habits". Interviewee-3

"Regular mealtimes are difficult to maintain due to hectic educational schedules and other responsibilities" Interviewee-5

"There is list of things to do for me everyday lack of time and academic activities puts me in difficulty so I could not care about my diet". Interviewee- 5

Financial Constraints

"High prices and poor quality of fruits and vegetables make it difficult to maintain a healthy diet." Interviewee-2

Quality Issues

Fruit sellers often deceive customers said by interviewee-2

"I had a bad experience of purchasing fruit ever let me tell you one thing fruit sellers mostly dodge the customer but putting good fruit in front of cart and when they give you it's totally ripened so quality is not good. Secondly the prices of fruits are not affordable"

Discussion and Conclusion

Discussion

University students had adequate health literacy in specific domains but students exhibit unhealthy dietary patterns. The difference in dietary patterns and health literacy requires further study as the relationship between health literacy and dietary pattern is so complicated and context related. The health literacy identified in this study showed similar findings obtained from



previous studies. As Rosi et al. (2016) concluded that university students are more knowledgeable about nutrition so generally have adequate health literacy.

Similarly, Ickes and Cottrell (2010) explained that college students have a high level of health literacy based on their scores on various assessments. These findings indicate that students at university possess cognitive and social abilities to acquire, comprehend, and utilize health information. The noticeable difference between health literacy and dietary practices in our study is significant. Although students had health literacy skills, they displayed inconsistent eating habits, chose varied (and often poor) food choices, and faced challenges in adopting healthy eating patterns, especially when it came to consuming fruits, vegetables, and milk on a daily basis with proper meal type, time, and frequency. The discrepancy mentioned here is consistent with the results of Yahia et al. (2016), who found that even students with a strong understanding of nutrition frequently struggled to apply this knowledge to their eating habits. There are other causes that could account for this difference.

According to Deliens et al. (2014) proposed that dietary decisions at university are influenced more by environment than health literacy. Limited time, high stress levels, and ease to satisfy hunger availability of unhealthy food have a stronger impact in determining eating habits than health literacy. There exists a gap between pupil attitude and action. Sheeran and Webb (2016). According to Greaney et al. (2009) university students do not bother about health condition and give priority to academic and social responsibilities. Findings indicate that even students with a thorough understanding of health may choose to prioritize other tasks over maintaining a healthy diet. The challenges to adopting healthy dietary patterns revealed in our study are consistent with the findings of Sogari et al. (2018), who identified factors such as cost, convenience, and taste preferences as major barriers to healthy eating among college students.

Our findings differ from past research. For instance, Spronk et al. (2014) discovered a direct correlation between nutrition knowledge (a constituent of health literacy) and the quality of food among young adults. Cha et al. (2014) found that college students with higher health literacy were more likely to engage in healthy eating practices. These divergent results emphasize the elaborate connection between health literacy and dietary choices, indicating that there may be other factors that mediate or moderate this link. Thus, it is essential to motivate students for healthy diet by improving critical health literacy and focus other socio-personal determinants for



intervention. Plotnikoff et al. (2015) further suggested interventions that address both the talents of individuals and the surrounding factors in encouraging university students to adopt healthy eating habits. This study concludes that there is a notable disparity between the level of knowledge about health and the actual dietary habits of university students. This emphasizes the intricate relationship between several factors that impact eating behaviors in this particular group. Subsequent studies should investigate the intermediary elements that influence the relationship between health literacy and dietary decisions. Moreover, interventions should employ a holistic strategy that surpasses the mere provision of nutritional knowledge.

Conclusion

It is concluded that health literacy plays insignificant role in shaping dietary patterns of university students. There exists a gap between students, awareness and dietary behavior. General health literacy of students in terms of understanding health information, opinion about healthy lifestyle choices, communicating and assessing health care services and critical evaluation of information among students is good. Instead of this, inconsistent behavior was observed due to factors related with health literacy and dietary patterns. Therefore, there is a need to address these issues so that true application of health literacy could be seen in their behaviors and actions.

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