Relationship between Nutrition Literacy and Eating Pattern among Secondary School Nursing Students at Fayoum Governorate

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Abstract

Background: Nutrition literacy is a critical factor in promoting and maintaining good health outcomes, particularly in today's complex healthcare environment. It encompasses the ability to understand and use health information effectively, which directly impacts an individual's ability to make informed health decisions. **Aim :** The present study aimed to assess the relationship between nutrition literacy and eating pattern among secondary school nursing students at Fayoum Governorate. **Subject and Methods**: A convenient sample was used, including all students at the technical secondary schools for nursing in Fayoum Governorate. Design: A cross-sectional research study was used to carry out this study. Setting the study was conducted at three secondary schools of nursing in Fayoum Governorate for students from grades 1 to 3. Tools: Three tools were used to measure the current study variables, A structured interview questionnaire sheet, Nutrition Literacy questionnaire and Eating pattern questionnaire. **Results:-** Revealed that positive significant statistical correlation (r = 0.760) were between total eating pattern and nutritional literacy, with a highly significant p-value of less than 0.001. **Conclusion:** Statistical positive correlation was shown between total eating pattern and nutritional literacy among secondary school nursing students. **Recommendation:** Cooperation of various sectors and professionals within the community, including community organizations, health professionals, local educators, and community leaders; specifically, the involvement of food professionals is pivotal in leading health education programs.

INTRODUCTION:

Nutrition literacy and nutrition knowledge have emerged as critical components in promoting and maintaining healthy eating behaviors. Health literacy is defined as the degree to which individuals obtain, understand, and use basic health information and services to make informed health decisions. Nutrition literacy is a special component of health literacy **(Aljassim, & Ostini, 2020).**

Balanced diet which can help in maintaining immunity is important for prevention and management of viral infections. There are several vitamins and trace elements which are essential for the normal functioning of the immune system. Eating a broad variety of foods in the right proportions, and consuming the right amount of food and drink to attain and maintain a healthy body weight **(Armet et al., 2022).**

Poor eating habits are a significant public health concern that

has great health and cost-effective intention. Many food preferences are recognized early, but since people make more and more self-regulating eating decisions as they move through puberty is an important event. Nearly all of the university students seem to be affected by this nutrition transition **(Choi, 2020).**

According to **Cena, &Calder, (2020)**, nutrition is the study of nutrients in food, how the body uses them, and the relationship between diet, health, and disease. Nutritional status is the sum total of an individual's anthropometric indices as influenced by intake and utilization of nutrients, which is determined from information obtained by physical, biochemical, and dietary studies.

Secondary nursing schools offer many benefits to students who are interested in pursuing a career in nursing. They provide a focused and comprehensive nursing education, hands-on clinical experience, and a

range of programs that cater to students with different educational backgrounds and career goals. As the demand for health care professionals continues to grow, secondary nursing schools will continue to play a crucial role in preparing the next generation of nurses (**Yildiz et al., 2021**).

Community Nurses play an important role in protecting and improving health and increasing the quality of life. It is an important group of healthcare professionals involved in the delivery of nutritional care to patients and they work closely with patient groups and have opportunities to identify at-risk health behaviors. Nurses who provide nutritional care to patients need to determine their nutrition knowledge levels and accordingly, individuals with low nutrition knowledge need to improve their nutrition knowledge (**Mann et al., 2023**).

As a result, the dietary habits have been changing during the last decades, described by an increase of fat intake, commonly in saturated fat, beside a decline in cereals, fruits, legumes and vegetables eating. Cultural factors such as dietetic practice, attitude towards food are varying which finally affects the impact of eating habits (**Ismail et al., 2021**).

Significance of the Study.

Poor nutrition quality and unhealthy eating pattern are major risk factors for chronic illnesses such as obesity, diabetes, cardiovascular disease, and several malignancies. Therefore, dietary risks have received more attention during the last decade. Dietary risk factors were responsible for 7.9 million deaths and 187.7 million disability-adjusted life years in 2019 (**Alzahrani et al., 2020**).

Furthermore, this study can contribute to the existing literature on the relationship between nutrition literacy and health outcomes, which can inform future research and policy

decisions in the field of healthcare and nutrition education. Ultimately, this study can help to improve the quality of education for nursing school students and promote better health outcomes for patients. **(Ahmadi, & Karamitanha, 2023).**

Aim of the study:

The aim of this study was to assess the relationship between nutrition literacy and eating patterns among secondary school nursing students at Fayoum Governorate.

Research questions

1- What is the knowledge regarding nutrition literacy among secondary school nursing students?

2- What is the eating pattern among secondary school nursing students?

3- Is there a relation between nutrition literacy and eating pattern among secondary school nursing students?

Subjects and Methods:

Research design

A cross-sectional study with an analytical component was used to for carrying out this study.

Settings

The study was conducted at secondary schools of nursing at Fayoum governorate for student from grade1 to3.

1-& School of Nursing for Girls in Ibshway and Youssef EL-Seddik.

2-School of Nursing for Boys in Lahoun.

3-School of Nursing for Boys in Mattaras.

Sample:

A convenient sample including the students at the technical secondary school for nursing in Fayoum governorate.

Sample size:

Sample size was calculated using Cochran (1977) formula for sample size of finite population.

	No.	Sample
School 1+2	198	86
School 3	200	88
School 4	100	44
Total	498	218

Tools of data collection

(Tool I): **A structured interview questionnaire sheet:**

It was prepared by the researcher after reviewing the relevant and current literature and designed in an Arabic language to suit understanding of the study subjects such as student's age, residence and their anthropometric measurements which involved data about the students' weight and height.

(Tool II): Nutrition Literacy questionnaire:

This tool was adapted from **Cesur et al. (2015),** and it consists of 35 questions that covering five sections as: general nutrition information, reading comprehension and interpretation, food groups, serving sizes and reading food labels.

Scoring system:

- Each correct answer was score 'one' and wrongly answered questions scored 'zero'. The scores were summed and converted into a

percentage, which was then classified into two categories:

- Satisfactory level, if score ≥ 60 %.
- Unsatisfactory level, if score < 60 %.

(Tool III): Eating pattern questionnaire:

A Likert-like scale was used to assess how often participants practiced specific eating habits. It was adapted from **Gunes et al. (2012).** The scale consisted of four sections: unhealthy food habits, eating healthy food, planning for healthy eating, and following healthy eating habits.

Scoring system:

The scale included five response options: repeatedly, often, occasionally, seldom, and never, with scores ranging from One to Five for each item. The scores were summed and converted into a percentage, which was then classified into three categories:

- Healthy pattern, if score > 75 %.
- Somewhat, if score 50 % - 75%.

- Unhealthy level, if score < 50 %.

Validity:

The tools were submitted to a jury committee of three experts in the field of community nursing at the faculty of nursing - Fayoum University; each of the expert panel was asked to examine the instruments for its content validity, coverage, clarity, wording, length, format, applicability, and overall appearance. No modification was done.

Reliability:

Reliability of the tools was performed to confirm the consistency of tools. The internal consistency was measured to identify the extent to which the items of the tool measured what it was intended to measure and distributed as follows: -

Tool	Cronbach alpha
Tool (I): A structured interview questionnaire sheet	0.884
Tool (II): Nutrition Literacy questionnaire	0.801
Tool (III): Eating pattern questionnaire	0.829
Total	0.843

Pilot Study

A pilot study was conducted on 10% (21 students) of the sample size to assess the clarity of the research tools and estimate the time required for their completion in the specified study settings. This preliminary evaluation examined both the clarity and applicability of the study instruments. Based on the pilot study findings, no modifications were implemented to the tools.

II. Administrative Design

Official permission to conduct the study was obtained from both the Dean of the Faculty of Nursing at Fayoum University and the director of the aforementioned study setting. The researcher met with the director to explain the study purpose and data collection methodology.

Ethical Consideration:

Ethical approval was obtained from the Faculty of Nursing Ethical Committee at Fayoum University (RHDIRB30012022001 in 30 January 2022) prior to study

commencement. The researcher explained the study's purpose and objectives to all participating mothers before data collection began. Oral informed consent was obtained from each student prior to their inclusion in the study. All collected data were treated confidentially and used solely for research purposes. The researcher maintained strict anonymity and confidentiality of participants' data throughout the study.

Fieldwork

The actual field work started at the beginning of January 2024 to the end of June 2024. To carry out the study, an approval was obtained from the directors of the four schools. A letter was issued to them from Dean of faculty of nursing Fayoum University, explaining the aim of the study in order to obtain their permission and cooperation. The researcher visited the study setting 2days/weekly (Monday -

Wednesday) from 9:00 am to 2:30pm.

Table (1) shows that student demographic data as for age, (42.2%) of nursing students was 15 years old with mean age was 16.43+_ 1.29. While female students more than male students (53.2% vs. 46.8%). Respectively (61.9%) lived in rural areas. TV is the most popular media device at home (76.1%), while over two-thirds of homes have three rooms (67.9%) and report inadequate monthly income (83.9%).

Table (2) shows that nursing students typically weight 58.7 kg and measure 161.1 cm in height. None are underweight or obese, and (92.2%) maintain a healthy weight, while (7.8%) are overweight. Almost all nursing students (98.2%) reported being healthy. Regarding family health, about (32.6%) report iron deficiency anemia as the most common condition, followed by less than quarter with diabetes mellitus (17.0%) and with hypertension

(14.2%). Family members with obesity are (6.9%).

Table (3) shows that the overall nutritional literacy among nursing students remains low, with only about (33.9%) meeting acceptable standards. The highest competency lies in obtaining nutritional information, where (42.7%) are proficient. However, critical assessment skills show a moderate proficiency at (39.4%). Understanding nutritional concepts follows closely, with (37.6%) demonstrating adequate comprehension. In contrast, knowledge (26.1%), application (28.4%), and interactive skills (30.7%) are notably weaker, with most students lacking in these areas.

Table (4) outlines perceptions of eating habits, indicating (67.9%) acknowledge unhealthy eating habits, while only about (25.7%) perceive themselves as consistently eating healthy foods. Additionally, (49.1%) describe their overall eating habits as unhealthy, signaling a widespread challenge in adopting healthier behaviors. On a more positive note, (39.9%) report actively planning for healthy eating, suggesting efforts are being made despite existing challenges.

Table (5) shows a statistically significant correlation between eating habits and overall nutritional literacy, with a chi-square value of 156.700 and a p-value of less than 0.001. About (31.2%) of individuals with healthy eating habits have completed nutritional literacy, whereas none of those with unhealthy eating habits have. On the other hand, (47.2%) of individuals who reported poor eating habits were not nutritionally literate.

Table (6) presents the results of a regression analysis exploring the factors influencing total nutritional literacy. Age and gender are statistically significant predictors of nutritional literacy, with both showing negative relationships. As

age increases, nutritional literacy tends to decrease (B = -0.137, p = 0.034), while males generally exhibit lower nutritional literacy compared to females (B = -0.240, p < 0.001). Father's educational level is also a significant predictor, with a stronger negative impact on nutritional literacy (B = -0.198, p < 0.001). Interestingly, while residence (urban vs. rural) and mother's job show moderate effects, they do not reach statistical significance at the conventional 0.05 level. Other variables, such as studying grade, father's job, and mother's educational level, do not exhibit significant effects on nutritional literacy. These findings suggest that parental education and gender are key factors influencing nutritional literacy, with a potential need for targeted interventions to address these disparities.

Table (1) Socio-demographic characteristics of nursing students (n=218)

Items	N	%
Age		
15	92	42.2
16	67	30.7
17	59	27.1
Mean±SD	**16.43±1.29**	
Gender		
Male	102	46.8
Female	116	53.2
Residence		
Rural	135	61.9
Urban	83	38.1
Studying in grade		
1st grade	92	42.2
2nd grade	67	30.7
3rd grade	59	27.1
Number of main meals per day		
1 to 2	211	96.8
3 to 4	7	3.2
Number of snacks per day		
3 to 4	207	95.0
more than 4	11	5.0
Father educational level		
Illiterate	22	10.1
read and write	37	17.0
primary level	50	22.9
secondary level	81	37.2
university education	28	12.8
Father job		
Free work	55	25.2
Employee	126	57.8
Not work	37	17.0
Mother educational level		
Illiterate	31	14.2
Read and write	26	11.9
Primary level	68	31.2
Secondary level	78	35.8
University education	15	6.9
Mother occupation		
House wife	157	72.0
Work	61	28.0
Number of educated persons at home	183	83.9
Number of rooms at home		
3	148	67.9
4	70	32.1
Monthly income		
Sufficient	35	16.1
Insufficient	183	83.9
Media at home		
Radio	15	6.9
TV	166	76.1
Computer	31	14.2
Internet	26	11.9

Table (2) Anthropometric Measurements and Health Status of Nursing Students (n=218)

Anthropometric measurements of nursing students	N	%
Height	161.1±2.84	
Weight	58.7±3.12	
BMI		
Healthy weight	201	92.2
Over weight	17	7.8
Do you suffer from any disease		
Yes	4	1.8
No	214	98.2
History of chronic diseases		
Obesity	15	6.9
Diabetes mellitus	37	17.0
Iron deficiency anemia	71	32.6
Hypertension	31	14.2

Table (3): Nutritional Literacy Levels among Nursing Students: Knowledge, Application, and Critical Skills (n=218)

Items of nutritional literacy	Done		Not done	
	N	%	N	%
Knowledge	57	26.1	161	73.9
Understanding	82	37.6	136	62.4
Obtaining	93	42.7	125	57.3
Applying	62	28.4	156	71.6
Interactive	67	30.7	151	69.3
Critical	86	39.4	132	60.6
Total nutritional literacy	74	33.9	144	66.1

**Table (4): Perceptions of Eating Patterns: Healthy vs. Unhealthy Habits (n=218)**

| Items of eating Pattern	Healthy		Somewhat		Unhealthy	
	N	%	N	%	N	%
Unhealthy eating habits	148	67.9	34	15.6	36	16.5
Eating healthy foods	56	25.7	36	16.5	126	57.8
Following healthy eating habits	68	31.2	43	19.7	107	49.1
Planning for eating healthy food	87	39.9	38	17.4	93	42.7
Total eating Pattern	78	35.8	37	17.0	103	47.2

Table (5): Relationship Between Eating Patterns and Nutritional Literacy (n=218)

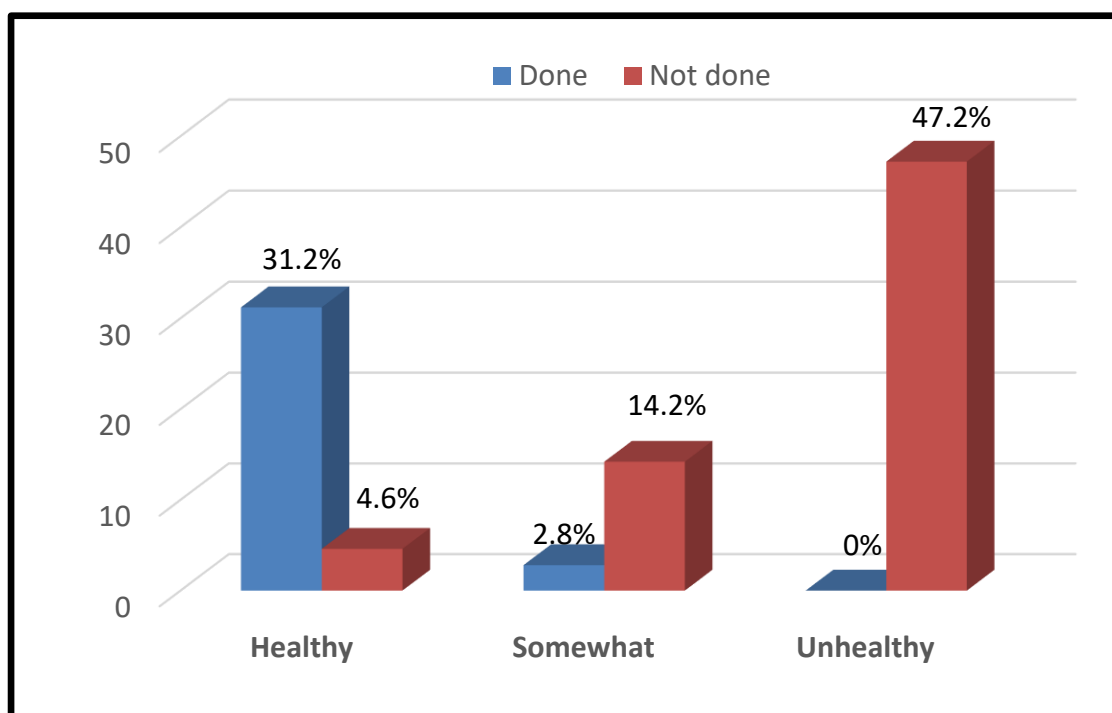| Total eating Pattern	Total nutritional literacy					
	Done		Not done		Chi-square	
	N	%	N	%	X^2	P-value
Healthy	68	31.2	10	4.6		
Somewhat	6	2.8	31	14.2	156.700	<0.001*
Unhealthy	0	0.0	103	47.2		

Table (6): Factors Affecting Nutritional Literacy: A Regression Analysis

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95% CI	
	B	**S.E**	**Beta**			**Lower**	**Upper**
(Constant)	3.351	0.276		12.154	0.000	2.808	3.895
Age	-0.137	0.064	-0.237	-2.135	0.034	-0.264	-0.011
Gender	-0.240	0.051	-0.253	-4.717	0.000	-0.340	-0.140
Residence	-0.132	0.091	-0.136	-1.461	0.146	-0.311	0.046
Studying in grade	0.087	0.065	0.151	1.341	0.181	-0.041	0.215
Father educational level	-0.198	0.032	-0.490	-6.153	0.000	-0.261	-0.134
Father job	-0.127	0.071	-0.173	-1.804	0.073	-0.267	0.012
Mother educational level	0.042	0.028	0.101	1.514	0.131	-0.013	0.096
Mother job	-0.230	0.119	-0.218	-1.927	0.055	-0.465	0.005
Dependent Variable: Total nutritional literacy							
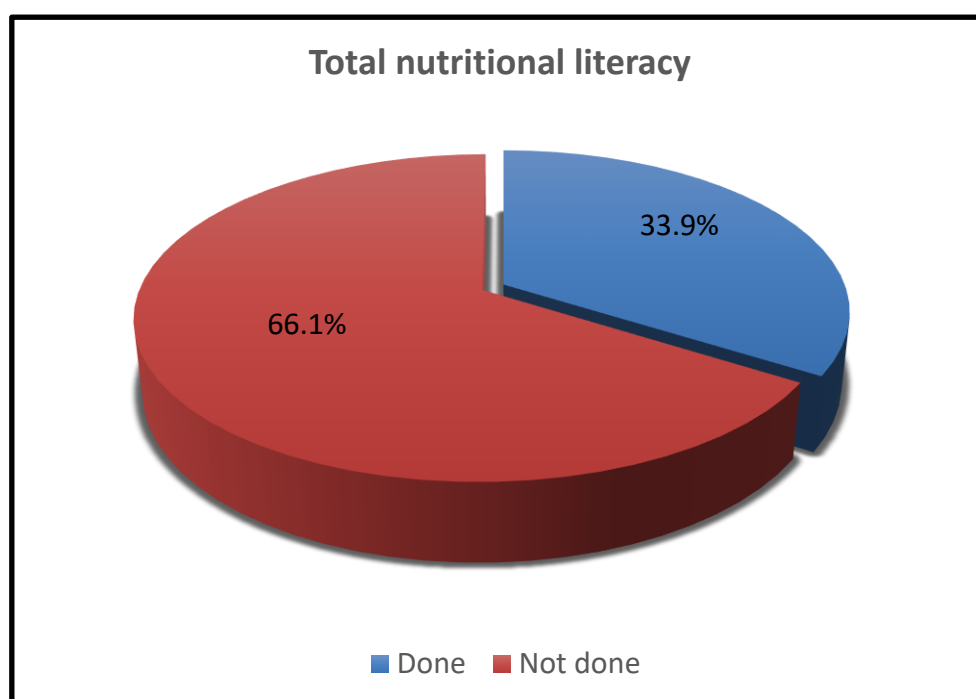
Figure (1): Total nutritional literacy
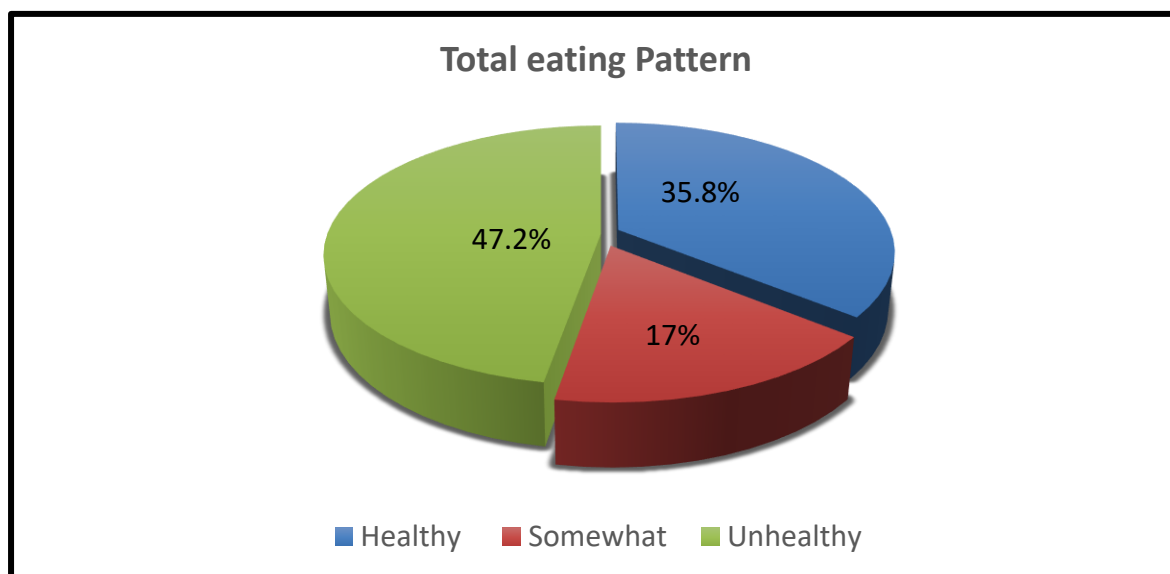
Figure (2): Total eating pattern

Figure (3): Relationship Between Eating Patterns and Nutritional Literacy (n=218)

Discussion

As regard to personal data among the studied sample, the current study findings showed that, that less than half of nursing students were in age of 15 years old with mean age (16.43±1.29); this may be due to the highest percentage of the study sample from first and second year.

According to gender, Findings of the present study showed that more than half of the nursing students were female. These results may be explained by the fact that nursing is a universal feminine profession especially in our society culture as well as the enrolment of the male students in this profession was started in the late decades.

Regarding to residence, findings of the present study showed that about two thirds of nursing students belonged to rural areas. From the researcher point of view this may be due to most of the governorate in Upper Egypt is villages. This finding is agree with

Abderbwih, (2024), who concluded that more than half of the study sample belonged to rural areas. The same reported by **El-Kader *et al.*, (2019),** who conducted a study entitled" dietary habits and nutritional knowledge among primary school children in Fayoum governorate" they reported that more than half of nursing students were from rural areas.

As regards, educational grade, the current study findings showed that more than half of nursing students were at the first and second year respectively. This study results is similar to the study of **Amin *et al.*,(2024),** who revealed that around one half of the study sample were at the first and second academic year. Also, **Ismail *et al.*,(2025),** conducted a study entitled " School Age children's Awareness regarding Obesity Prevention " they revealed that near to half of the study sample were at the second academic year and

around one third were at the first academic year.

Concerning parents' educational level, the current study findings revealed that the highest percentage of student parents had secondary school degrees. From the researcher point of view, this may be attributed to many parents often attain only a basic level of education due to limited access to higher education, economic constraints, or early engagement in the workforce and residence in rural areas.

Regarding Father job, the current study findings demonstrated that more than half of students' fathers were employees. While more than two thirds of students mothers were housewives.

As regards, anthropometric measurements and health status of nursing students, in term of BMI, it was noticed that the vast majority of nursing students had healthy weight. This may be attributed to the occupational status of parents where

most fathers were employed and most mothers were housewives may contribute to a structured household environment.

Furthermore, employed fathers may provide financial stability, even if limited, while housewife mothers may have more time to prepare home-cooked meals, potentially supporting healthier eating habits. Although low income and modest educational levels typically present barriers to optimal nutrition, the students' health-focused academic environment may have counteracted these risks by promoting practical knowledge about balanced eating, physical activity, and disease prevention.

Therefore, the maintenance of a healthy BMI among these students may indicate the mediating role of nutrition literacy in overcoming socioeconomic challenges.

The current study finding was compatible with the study conducted by **Amin *et al.*, (2024),** the study

found that 82.6% of nursing students were in the acceptable weight category (BMI > 18.5-24.99 kg/m²), indicating that the vast majority had a healthy weight, with an average BMI of 20.3 kg/m² among the participants.

Concerning nutritional literacy levels among nursing students: knowledge, application, and critical skills, the current study findings showed that overall level of nutritional literacy among the nursing students is generally low. Most students did not demonstrate adequate performance across the various domains. The areas of knowledge and application were particularly weak, highlighting gaps in both theoretical understanding and the ability to use nutrition information in practical situations.

Similarly, interactive and critical literacy levels were insufficient, suggesting limited ability to engage in discussions about nutrition or evaluate dietary

information effectively. Although obtaining and understanding information were relatively better, a considerable number of students still struggled in these areas.

These findings emphasize the need to enhance nutrition education within nursing curricula to ensure that students are well-prepared to apply and communicate nutritional concepts in both personal and professional contexts.

This finding was similar to the study conducted by **Mostafazadeh *et al.*, (2024),** who concluded that using students had low nutritional knowledge, with passing rates of 66.9% for knowledge, 88.5% for attitude, and only 50% for practice, indicating a significant need for enhanced nutrition education in nursing programs.

In the same line, another research study concurs with **Munangatire *et al.*, (2022),** whose study entitled " Nursing students' understanding of health literacy and

health practices: a cross-sectional study at a university in Namibia" they reported that the overall mean Understanding of Health Literacy score was 13.04 ± 1.52. The majority ($n = 157; 76.5\%$) of the students were found to have adequate health literacy scores, 21.5% had moderate health literacy scores, and only 2% had inadequate health literacy scores.

The overall mean health practice score was 32.4 ± 5.50. Most ($n = 106; 51.7\%$) of the students were found to have poor health practices, 44.4% had average health practices, and just 3.9% had good health practices.

Concerning perceptions of eating patterns: healthy vs. unhealthy habits, the present study finding revealed that more than two-thirds acknowledge unhealthy eating habits, while only about a quarter perceive themselves as consistently eating healthy foods.

Additionally, nearly half describe their overall eating habits as unhealthy, signaling a widespread challenge in adopting healthier behaviors. On a more positive note, about two-fifths report actively planning for healthy eating, suggesting efforts are being made despite existing challenges.

The finding that most nursing students acknowledge their unhealthy eating habits reflects a level of self-awareness that is essential for behavior change.

Despite limited adherence to healthy dietary practices, as indicated by previous findings, students' ability to recognize their poor eating patterns may serve as a valuable entry point for targeted interventions. The fact that only a small proportion perceive themselves as consistently maintaining healthy diets further highlights the existence of a knowledge–behavior gap—where students may understand the principles of healthy eating but struggle to consistently apply them

due to personal, social, or environmental barrier

Moreover, the observation that nearly half of the students explicitly describe their overall eating habits as unhealthy highlights the widespread nature of this challenge. However, the reported efforts by some students to plan for healthy eating although still limited indicates motivation and willingness to change. This suggests that, with appropriate support, education, and access to resources, these students could improve their dietary behaviors. Therefore, addressing both internal barriers (like low confidence or motivation) and external factors (such as food availability and cost) will be essential in guiding students from awareness to sustained healthy eating practices.

The current study finding was agree with **Lee *et al.*, (2023),** who reported that Approximately less than half of participants report having a poor diet, yet more than fifth perceive their diet as healthy. This indicates a significant disconnect between actual diet quality and self-perception, highlighting the need for targeted educational interventions to improve dietary habits.

The same as reported by **Johnston *et al.*, (2020)**, who reported that despite the challenges, about 40% of individuals are actively planning for healthier eating, indicating a willingness to change. Furthermore, the paper highlighted that dietary patterns significantly influence health, with inappropriate eating habits linked to chronic diseases. While many acknowledge unhealthy habits, efforts to plan for healthier eating indicate a recognition of the need for improved dietary choices.

Regarding relationship between eating patterns and nutritional literacy, the current study findings revealed that there was a statistically significant correlation between eating habits and overall nutritional literacy, with a p-value of

less than 0.001. About a third of individuals with healthy eating habits have completed nutritional literacy, whereas none of those with unhealthy eating habits have. On the other hand, nearly half of individuals who reported poor eating habits were not nutritionally literate.

These results suggest that improving students' capacity to access, understand, and apply nutritional information may lead to more consistent adoption of healthy eating patterns. Given that nursing students are future health promoters, equipping them with strong nutritional literacy skills is essential—not only for their own well-being but also to prepare them to effectively counsel and influence patients and communities toward better nutrition practices.

This finding also was compatible with **Taylor *et al.*, (2019),** whose study entitled " Nutrition literacy predicts adherence to healthy/unhealthy diet patterns in adolescents with a nutrition-related chronic condition" found a significant correlation between dietary patterns and nutrition literacy (P < 0.001). Individuals with good nutrition literacy adhered more to healthy diets, while those with poor nutrition literacy consumed more unhealthy foods, indicating a clear relationship.

The current study was consistent with **Mortaş *et al.*, (2023),** whose study found significant correlations between food and nutrition literacy and sustainable eating behaviors, with p < 0.001. Higher FNLI scores were associated with better eating habits, indicating that nutritional literacy influences sustainable eating practices among young adults.

Regarding factors affecting nutritional literacy, the current study findings revealed that Age and gender are significant predictors of nutritional literacy, with both showing negative relationships. As

age increases, eating patterns become less healthy (B = -0.507, p < 0.001), and males tend to have less healthy eating patterns than females (B = -0.411, p < 0.001).

The current study finding was compatible with the study conducted by **Amin *et al.*, (2024)**, who reported that Age, gender and educational level are significantly affect nutritional literacy.

This finding was similar to the study conducted by **Sanlier et al., (2024)**, whose study found that older nursing students tend to have poorer eating habits, as indicated by a negative correlation between age and nutritional literacy. Males generally display less healthy eating behaviors compared to females, with a significant negative relationship noted in the findings.

Conclusion

Based on the findings of the current study, it is concluded that:

Secondary school nursing students demonstrate a generally low level of nutrition literacy and acknowledge having unhealthy eating habits, indicating a widespread challenge in adopting healthier behaviors. Additionally, a statistically significant positive correlation was found between overall eating patterns and nutrition literacy among these students. Consequently, the aim of this study was to assess the relationship between nutrition literacy and eating patterns among secondary school nursing students in Fayoum Governorate.

Recommendations

- Gender-specific interventions are necessary, as males tend to engage less in nutrition-related discussions, requiring targeted strategies to increase their participation.
- Family involvement is another key component, as parental food literacy and eating patterns significantly influence adolescents' nutritional behaviors.

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