Corresponding Author
C.M. Maithri,
Department of Biochemistry, Mandya Institute of Medical Sciences, Mandya -571401, Karnataka

Author Designation
[1]Post Graduate cum Tutor
[2]Junior Resident
[3]Associate Professor and In-charge
[4]Assistant Professor

A Cross-Sectional Study to Assess the Knowledge, Attitude and Practices About Nutrition and Their Correlation with Anthropometric Indicators Among Students of a Nursing College in Mandya

[1]Shoji George, [2]Abhigna Deepak, [3]H. Raghunath and [4]C.M. Maithri
[1-4]Department of Biochemistry, Mandya Institute of Medical Sciences, Mandya -571401, Karnataka

Abstract

Health is significantly influenced by dietary practices which in-turn impacts physical, mental, and cognitive development. Nursing students must understand the importance of proper nutrition to promote healthier lifestyles for themselves and the patients. To assess the knowledge, attitude and dietary practices about nutrition among students of a nursing college in Mandya along with their anthropometric indicators. To assess the correlation between knowledge, attitude, dietary practices and anthropometric indicators. A cross-sectional study was conducted among consenting nursing students (=18 years). Data regarding nutritional knowledge, attitude, and dietary practices scored on a 5-point Likert scale was collected using a pre-tested 31-item questionnaire (Cronbach's alpha = 0.704). Socio-demographic and anthropometric data were recorded. Analysis was done using SPSS ver.22 and Pearson's correlation was used to assess association between the study parameters. ($p < 0.05$ significant). Among 181 participants, 90.6% were 18–21 years and 96.7% were females. The mean Body Mass Index (BMI) was 21.45 ± 4.17 kg/m² and waist to hip ratio was 0.79 ± 0.08. BMI classification showed 47% normal, 22.7% underweight, 14.9% overweight, and 15.5% obese. Mean score for knowledge, attitude and dietary practices were 4.18 ± 0.33, 4.11 ± 0.3 and 3.35 ± 0.56 respectively. Positive correlation was observed between knowledge and attitude ($r = 0.330$, p value < 0.00), attitude and practice ($r = 0.174$, $p = 0.019$); but not between knowledge and dietary practices ($r=0.082$, $p=0.269$). Data analysis showed no association between anthropometric indicators vs knowledge (WHR: $r=-0.069$, $p=0.3511$; BMI: $p-0.160$) attitude (WHR: $r=-0.092$, $p=0.213$; BMI: $p-0.699$) and dietary practices (WHR: $r=0.13$, $p=0.079$; BMI: $p-0.741$). The study participants had good nutritional knowledge and attitude but lower dietary practice scores. The findings suggest that good nutritional knowledge and attitude did not translate into healthier dietary practices among the students. There was no significant correlation between nutritional knowledge, attitude and the dietary practices of the students with their anthropometric indicators.

INTRODUCTION

A student's health is an important aspect of their life, largely determined by their dietary choices. Nutrition directly or indirectly impacts a student's physical, mental and cognitive development. Transitioning to college can be challenging for many young individuals as they navigate increasing independence, social interactions, self-discipline, and time management[1]. Nursing students in particular, often face demanding schedules and extensive course work that requires prolonged periods of sitting and studying. Long study hours frequently lead to snacking on unhealthy, processed foods that are easily accessible and seem convenient. However, many fail to recognize the long-term consequences of these dietary habits. Poor health can interfere with daily activities and hinder a student's ability to learn effectively. A well-nourished student is more likely to excel academically, be socially engaged and maintain an active lifestyle. Unhealthy eating patterns are linked to serious long-term diet related Non-Communicable Diseases (NCD) like cardiovascular disease, diabetes mellitus, hypertension etc. later in life. Therefore, ensuring proper nutrition among students has become a growing concern[2]. Moreover, the rising consumption of highly processed foods rich in sugars and fats, combined with decreased physical activity and limited access to a diverse diet worsens micro-nutrient deficiencies and obesity-related issues. Studies show that unhealthy, high-fat, sugar and salt foods have become more affordable and readily available than healthier options. Aggressive marketing and advertising across various media platforms, including social media, significantly influence dietary choices in both children and adults, leading to long-term health consequences. Choosing these unhealthy foods contribute to iron and folic acid deficiencies which can cause anaemia, as well as an increased prevalence of overweight and obesity in different population groups[3]. As future health care providers, nursing students must be well-educated on nutrition and its impact on health, enabling them to guide and educate patients toward healthier lifestyles. Improving nutrition education in nursing schools can enhance students' knowledge, allowing them to apply these principles in their dietary practices for better academic performance and future professional practice. The present study aims to assess the knowledge, attitude and practices regarding nutrition among nursing students in Mandya. Given the limited studies available on this topic specifically in the South Karnataka region, the study will help in bridging the existing knowledge gap and provide valuable insights regarding the same.

Objectives:
- To assess the knowledge, attitude and dietary practices about nutrition among students of a nursing college in Mandya along with their anthropometric indicators.
- To assess the correlation between knowledge, attitude, dietary practices and anthropometric indicators.

MATERIALS AND METHODS

The study was designed as a cross-sectional study conducted over a period of one month. The study population consisted of consenting nursing students of both genders aged ≥ 18 years from a nursing college in Mandya. A census method was used for sampling and the sample size included all the students admitted to the nursing college.

Method of Data Collection: The socio-demographic details of students including age, gender and place of stay recorded in the participant proforma. A questionnaire prepared and pre-tested in a similar sample other than the study subjects was used to assess the knowledge, attitude and practice about nutrition among nursing students. It included 31 questions in which 13 questions assess knowledge, 9 questions each to assess attitude and practice. The questionnaire was scored based on a 5-point Likert scale in which responses were assigned numerical values, with higher scores reflecting a stronger level of agreement with the statement. The reliability of the questionnaire was assessed using the Statistical Package for the Social Sciences (SPSS) version 22 to calculate internal reliability, using Cronbach's alpha coefficient. The pre-testing was conducted on a sample size of 53 nursing students and yielded a Cronbach's alpha value of 0.704.

Anthropometric Measurements: Height in centimetres (cm) was measured using a stadiometer and weight was measured in kilogram(kg) using a digital weighing machine. BMI is a nutritional index calculated using the weight measured in kilogram (kg) and height measured in square meters (m2). The formula is

$$BMI (kg/m^2) = \frac{Weight (kg)}{Height (m^2)}$$

A non-stretchable tape was used to measure the waist and hip circumference in cm. Waist-to-hip ratio (WHR) is calculated using waist circumference (WC) and hip circumference. The formula is:

$$WHR = \frac{Waist\ circumference\ (cm)}{Hip\ circumference\ (cm)}$$

According to World Health Organisation (WHO), BMI was classified as $<18.50 kg/m^2$ as underweight, $18.50\text{-}24.99\ kg/m^2$ as normal, $\geq 25.00\text{-}29.99 kg/m^2$ as obese and $\geq 30.00\ kg/m^2$ as overweight. WHR ≥ 0.95 in males and ≥ 0.85 in females were considered as obese as per WHO.

Data Analysis: The collected data was entered in Microsoft Excel and analysed using SPSS version 22. Descriptive statistics like percentage, proportion was used for categorical data (gender). For continuous data like age, weight, height, BMI, waist circumference, hip

circumference, WHR and nutrition questionnaire scores, mean and standard deviation were used. Pearson's correlation coefficient was used to measure associations between nutrition knowledge scores and anthropometry indicators. Statistical results were considered significant at $p<0.05$.

RESULTS AND DISCUSSIONS
Of the 181 participants, 90.6% were aged 18-21 years, 8.3% were 22-25 years and only 0.6% were aged 26 or above. The majority were female (96.7%), with males comprising just 3.3% of the sample.

Table 1: Descriptive Statistics of Anthropometric Indices

Variable	Mean	SD	Minimum	Maximum
Weight (Kg)	52.999	10.821	33.40	105.40
Height (cm)	157.238	7.485	136.0	178.0
BMI (kg/m2)	21.448	4.174	13.2	42.8
Waist circumference (cm)	71.348	9.828	53.0	109.0
Hip circumference (Cm)	90.387	9.296	52.0	122.0
WHR	0.79	0.08	0.61	1.21

(Table 1) shows that participants had a mean weight of 53±0.82 kg and height of 157.2±7.49 cm. The average BMI was 21.45±4.17 kg/m² (range: 13.2-42.8). Mean waist and hip circumferences were 71.35±9.83 cm and 90.39±9.30 cm, respectively, with a mean WHR of 0.79±0.08.
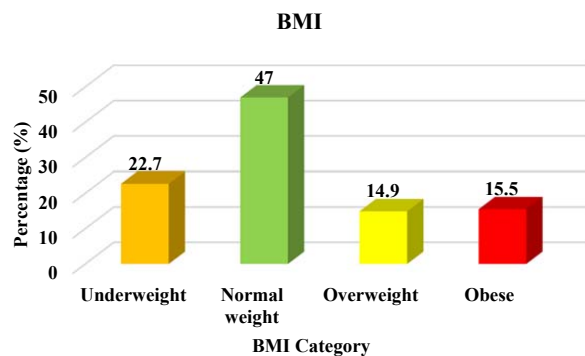

BMI

Fig. 1: Bar Graph Showing the Distribution of BMI Among Study Subjects

As per (Fig 1) BMI classification showed that 47.0% of participants had normal weight, 22.7% were underweight, 14.9% were overweight and 15.5% were obese.

Table 2: Descriptive Statistics of Knowledge, Attitude and Dietary Practice Scores

Variable	Mean	SD	Range	Minimum	Maximum	Median
Knowledge	4.176	0.33	1.6	3.3	4.9	4.2
Attitude	4.106	0.31	1.6	3.2	4.8	4.1
Practice	3.347	0.56	2.8	2.0	4.8	3.3

The mean±SD value of knowledge, attitude and practice of the study participants were 4.18±0.33, 4.11±0.3 and 3.35±0.56 respectively as shown in (table 2).

Table 3: Correlation Between Knowledge, Attitude and Practice Scores

	Knowledge score	Attitude score	Practice score
Knowledge score		r=0.330	r=0.082
		p=0.000	p=0.269
Attitude score	r=0.330		r=0.174
	p=0.000		p=0.019
Practice score	r=0.082	r=0.174	
	p=0.269	p=0.019	

The analysis showed a significant positive correlation between knowledge versus attitude (r=0.330, $p<0.001$) and between attitude versus practice (r=0.174, p=0.019). However, no significant correlation was found between knowledge and practice (r=0.082,
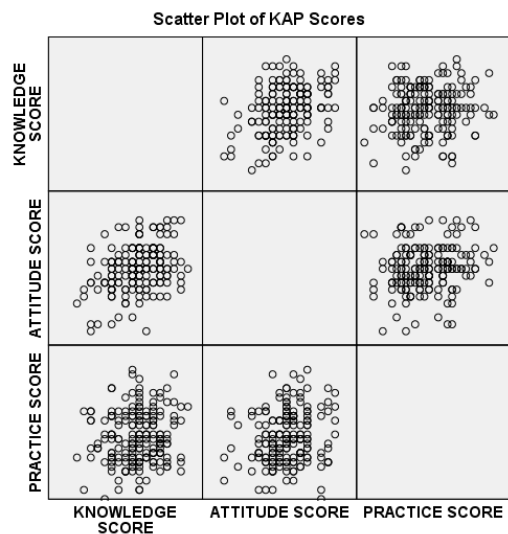

Fig. 2: Scatter Plot Matrix Shows the Relationship Between Knowledge, Attitude and Practice Scores

Dietary guidelines for Indians published by the Indian Council of Medical Research (ICMR)-National Institute of Nutrition (NIN) has provided data showing that unhealthy diets contributed to 56.4% of the total disease burden in India. India is experiencing a rising concern of dual burden of malnutrition- undernutrition and overweight/ obesity occurring concurrently[3]. In our study, mean value of BMI of nursing students was 21.448±4.174 kg/m² which is similar in a study by Osaka R, Nanakorn S among nursing students[4-8]. Students possess a reasonable understanding of nutritional knowledge (mean value of 4.176±0.33) for maintaining health., however, their food choices (mean dietary practice score is 3.347±0.56) often do not reflect this knowledge, with convenience and taste taking precedence as seen in a study by Abraham S, R. Noriega B, *et al* done among college students eating habits and knowledge[9]. The correlation analysis in our study revealed a significant positive association between knowledge and attitude scores (r=0.330, p<0.001), indicating that higher nutritional knowledge is associated with more favourable attitudes. A weak but significant correlation was also observed between

attitude and practice scores (r=0.174, p=0.019), suggesting that positive attitudes may influence dietary behaviours. However, the correlation between knowledge and practice scores was weak and not statistically significant (r=0.082, p=0.269), indicating that knowledge alone may not directly translate into healthy dietary practices. Similar observations have been seen in a study among college students by A. Barzegari, M. Ebrahimi *et al* where greater nutrition knowledge is linked to more positive attitudes, but it does not directly influence their dietary practices[10-14]. This suggests that improving knowledge alone may not directly influence healthy dietary practice., but then, attitude plays an important role in bridging knowledge and practice.

CONCLUSION

Our study participants had good scores on nutritional knowledge and attitude but lower dietary practice scores. This suggests that participants had good nutritional knowledge and attitude but this did not mean they followed healthy dietary practices. There was no significant correlation between nutritional knowledge, attitude and the dietary practices of the students with their anthropometric indicators. We observed that good knowledge is positively associated with a healthier attitude toward nutrition., but then this positive attitude does not enable them to follow healthy dietary practices. This shows us that it would be better to incorporate nutrition knowledge into their curriculum and cultivate a positive attitude with regards to nutrition which in turn would enable them to follow proper dietary practices for themselves and also to advise their patients regarding the same during their training period.

ACKNOWLEDGEMENT

REFERENCES

1. Mizia S., A. Felinczak, D. Wlodarek and M. Syrkiewicz-Switala., 2021. Evaluation of Eating Habits and Their Impact on Health among Adolescents and Young Adults: A Cross-Sectional Study. Int. J. Environ. Res. Public Health, Vol. 18. 10.3390/ijerph18083996.
2. Kesapragada S., A. Teli and L. Mullur., 2024. Assessment of Knowledge and Attitude of Medical Students Towards Nutrition and Health: A Cross-Sectional Study. Cureus, Vol. 16. 10.7759/cureus.68329 1-10.0.
3. ICMR-NIN Expert Committee., 2024. Dietary guidelines for Indians. National Institute of Nutrition. 2nd ed., Edn., ICMR- National Institute of Nutrition., Telangana.
4. Pathak B., R. Hadaye and S. Lavangare., 2019. Nutritional status of the student nurses of a tertiary health-care center-A mixed-method study. J. Family Med. Primary Care, Vol. 8: 10.4103/jfmpc.jfmpc_314_18.
5. Çelik Ö.M. and R. Semerci., 2022. Evaluation of nutrition literacy and nutrition knowledge level in nursing students: A study from Turkey. BMC Nurs., Vol. 21. 10.1186/s12912-022-01146-z.
6. Sakamaki R., K. Toyama, R. Amamoto, C.J. Liu and N. Shinfuku., 2005. Nutritional knowledge, food habits and health attitude of Chinese university students-a cross sectional study. Nutr. J., Vol. 4. 10.1186/1475-2891-4-4.
7. Mearns G.J., L. Chepulis, S. Britnell and K. Skinner., 2017. Health and Nutritional Literacy of New Zealand Nursing Students. J. Nurs. Educ., Vol. 56: 10.3928/01484834-20161219-09.
8. Osaka R., S. Nanakorn, L. Sanseeha, C. Nagahiro and N. Kodama., 1999. Healthy dietary habits, body mass index and predictors among nursing students, northeast Thailand. The Southeast Asian journal of tropical medicine and public health., 30: 115-121.
9. Abraham S., B.R. Noriega and J.Y. Shin., 2018. College students eating habits and knowledge of nutritional requirements. J. Nutr. Hum. Health, Vol. 2. 10.35841/nutrition-human-health.2.1.13-17.
10. Ebrahimi M., 2011. A study of Nutrition knowledge, attitudes and food habits of college students. 0 15: 1012-1017.
11. Gaikwad S., D. Asokan, A. Mall, S. Sharma and G. Pardeshi., 2024. Knowledge, attitude and practice of fast-food consumption among the undergraduate nursing students of a tertiary-level hospital. International journal of scientific research, Vol. 1: 10.36106/ijsr/8209230.
12. Barzegari A., M. Ebrahimi, M. Azizi and K. Ranjbar., 2011. A study of nutrition knowledge, attitudes and food habits of college students. World Applied Sciences Journal., 15: 1012-1017.
13. Schwartz N.E., 1976. Nutrition knowledge, attitudes and practices of canadian public health nurses. J. Nutr. Educ., Vol. 8: 10.1016/S0022-3182(76)80113-6.
14. World Health Organization., 2000. Obesity: Preventing and Managing the Global Epidemic. TRS., Vol. 0.