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Original Article

Impact of Nutrition Education on Dietary Habits among Bachelor-in-Medicine, Bachelor-in-Surgery (MBBS) Students: A Study in an Indian Medical College

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Abstract

Background: Unhealthy eating patterns, often triggered by academic pressures and erratic schedules, can negatively impact students' health and hinder their ability to effectively guide future patients. Nutrition education offers a valuable opportunity to promote healthier eating habits by providing critical knowledge that supports both students' personal wellbeing and professional competence.

Objective: To evaluate the effect of nutrition education on eating habits of first-year Bachelor-in-Medicine, Bachelor-in-Surgery (MBBS) among medical students.

Methods: A pre-post interventional study was carried out on 200 Phase-1 MBBS students of Muzaffarnagar Medical College between January and June 2024. Initial dietary habits were assessed using a validated questionnaire. A structured session of nutrition education was provided. The dietary habits were then re-assessed after four weeks, and changes were analyzed using paired statistical tests.

Results: Data collected after the intervention showed notable enhancements in dietary practices. The percentage of students consuming three balanced meals a day increased from 32% to 68% ($p < 0.001$). The intake of fast food decreased from 65% to 35%, and the consumption of sugar-sweetened beverages fell from 58% to 30%. The average servings of fruits and vegetables consumed daily rose from 2.1 to 4.5 ($p < 0.01$). Nutrition knowledge scores presented a 30% improvement, indicating greater awareness.

Conclusion: Medical students' eating habits are much improved by nutrition education, underscoring its significance in medical education. Future healthcare workers may benefit from lifelong good eating habits if such programs are incorporated into the curriculum, which would improve patient care and their own health.

Keywords: Dietary practices, health promotion, intervention studies, medical students, nutrition education

Introduction

Medical students, who frequently encounter major nutritional issues because of their hectic schedules, stress, and lack of time for meal preparation, depend heavily on their diet for both their general health and academic achievement. Research indicates that medical students' bad eating habits can have a detrimental effect on their academic performance and future clinical practice by causing health problems such obesity, metabolic syndrome, and burnout.[1,2] Moreover, as future healthcare providers, medical students must possess adequate knowledge and practice of healthy dietary habits to effectively model and promote preventive health behaviors.[3,4]

One successful strategy for addressing these issues is nutrition education. In addition to improving students' understanding, including nutrition instruction within the medical curriculum motivates them to follow healthy eating habits.[5] Global studies have demonstrated that well-designed nutrition education programs significantly improve medical students' nutritional knowledge, attitudes, and dietary practices.[6] Nutrition education is frequently underemphasized in medical curriculum, especially in the initial years of training, despite its demonstrated advantages.[7]

Targeted nutrition education interventions are best suited for phase 1 MBBS students, who are just starting their medical careers. Cultivating sound dietary practices and nutritional understanding during this pivotal educational phase offers enduring advantages for medical students' well-being and professional effectiveness. However; investigations into the specific effects of nutrition education on the dietary patterns of this group are notably limited, revealing a clear need for further study.[8] This study aimed to assess the impact of a structured nutrition education intervention on the dietary habits of first-year MBBS students. Identifying changes in dietary behaviors and nutritional awareness may contribute to optimizing medical curricula and strengthening preventive health practices among future physicians.

Methods

This quasi-experimental study involved 200 first-year MBBS students (aged ≥18 years) from Muzaffarnagar Medical College, Uttar Pradesh, India. The study was conducted in the Department of Biochemistry using a one-group pretest–posttest design. Inclusion criteria required voluntary participation and the absence of prior formal nutrition education. Students with medical conditions that could influence dietary habits, such as eating disorders, were excluded.

A four-week structured Nutrition Education Program was implemented to evaluate changes in nutritional knowledge and dietary practices. Each session lasted 60 minutes and was conducted once weekly, totaling four hours of instruction. The sessions were delivered by faculty members from the Department of Biochemistry with expertise in nutrition, and the content delivery was standardized across all sessions through a structured teaching plan. The program covered essential topics including nutrition fundamentals, macro- and micronutrients, dietary standards, balanced meal preparation, portion control, and the relationship between healthy eating, disease prevention, and academic performance. Practical understanding was reinforced through meal planning exercises and food label interpretation. To enhance engagement, digital tools and educational materials such as PowerPoint presentations, short videos, and printed handouts were utilized, and their effectiveness was assessed through pre- and post-session quizzes and participant feedback.

Data collection was carried out using a validated semi-structured questionnaire developed based on previously established nutrition knowledge and dietary behavior assessment tools. The questionnaire was adapted and reviewed by subject experts in nutrition and biochemistry to ensure content validity. Its internal consistency and reliability were confirmed, with a Cronbach's α coefficient of 0.82, indicating good reliability. The questionnaire was administered both before and after the intervention to assess changes in participants' knowledge and dietary habits. It targeted three core aspects: 1) Demographic details (age, gender, living arrangements), 2) Dietary patterns (meal regularity, consumption of fruits/vegetables and junk food, hydration habits), and 3) Nutrition-related knowledge and attitudes (understanding of guidelines, recognition of balanced nutrition's importance). The project timeline featured distinct stages: The pretest established baseline metrics in Week 1. Weeks 1 through 4 were dedicated to implementing the comprehensive nutrition education intervention. Ultimately, in Week 5, the posttest was conducted, employing the baseline questionnaire to identify any intervention-related changes in knowledge or behavior. Ethical approval was obtained from the Institutional Review Board (MMC/IEC/2024/135). Written informed consent was obtained from all participants. Participation was voluntary, and anonymity and confidentiality were maintained.

Data was entered and analyzed using SPSS version 20. Descriptive statistics summarize demographic and dietary habit data. The Shapiro–Wilk test was used to assess the normality of data distribution prior to analysis. After confirming normality, paired t-tests were performed to compare pre- and post-intervention scores, with a p-value of <0.05 considered statistically significant.

Table 1 Demographic Characteristics of the Study Participants (n=200)

Variable	Category	Frequency	Percentage (%)
Gender	Male	107	53.3
	Female	93	46.5
Age	Mean ± SD	19.2 ± 1.3	
	Range	18–24	

Results

A total of 200 first-year MBBS students participated, including 48% females and 52% males, with a mean age of 19.2±1.3 years. This sample represented a diverse group of young adults in a medical education setting (Table 1).

The table 2 summarizes the distribution of 200 study participants based on their Body Mass Index (BMI) categories, divided by gender. Participants are classified into four BMI groups: underweight (BMI <18.5), normal weight (BMI 18.5–24.9), overweight (BMI 25–29.9), and obese (BMI >30). Among the participants, 107 are male students, and 93 are female students. The majority (173 participants, 86.5%) fall within the normal weight category, comprising 90 male students and 83 female students. A small number of participants are underweight (6 participants, 1 male students and 5 female students) or overweight (21 participants, 16 boys and 5 girls). Notably, no participants are classified as obese. These findings indicate that most participants have a healthy BMI, with a slightly higher prevalence of overweight among male students and underweight among female students.

Daily fruit and vegetable consumption, measured by frequency (times per day), increased significantly after the intervention, showing improvements of 85% and 75%, respectively. Fast-food consumption decreased by 44%, indicating better dietary choices. Water intake also improved, with a 60% increase in students meeting recommended hydration levels (Table 3).

Discussion

The findings of this study highlight the significant impact of nutrition education on improving dietary habits among Phase 1 MBBS students. The intervention demonstrated that structured and targeted nutrition education can effectively enhance knowledge, attitudes,

Table2 Distribution of Subjects According to Their Body Mass Index (BMI)

BMI Category	Male Students (n=107)	Female Students (n=93)	Total (n=200)
Underweight (<18.5)	1	5	6
Normal weight (18.5–24.9)	90	83	173
Over weight (25–29.9)	16	5	21
Obese (>30)	0	0	0

Table 3 Comparison of Pre- and Post-Intervention Dietary Habits

Parameter	Pre-Intervention (%)	Post-Intervention (%)	Percentage Change (%)	p-value
Daily fruit consumption	35	65	+30	0.001
Daily vegetable consumption	40	70	+30	0.002
Fast-food consumption	45	25	-20	0.003
Water intake ≥ 2L/day	50	80	+30	0.001

and behaviors regarding healthy eating practices, consistent with previous research findings in similar populations.[9,10]

The results revealed a marked improvement in the consumption of fruits, vegetables, and whole grains following the educational intervention. Supporting evidence from Hodder *et al*.[11] and Pem *et al*.[12] demonstrates a link between nutritional instruction and greater consumption of wholesome foods. The documented decrease in processed foods and sugary beverages reflects Von Philipsborn *et al*.[13] findings on improved dietary consciousness and intentional food selection. This shift signifies students became more adept at identifying and restricting unhealthy choices post-intervention, a critical development for lowering susceptibility to lifestyle-related illnesses like obesity, diabetes, and heart disease. Proficiency in deciphering nutritional labels was probably instrumental. Response heterogeneity implies pre-existing eating patterns, cultural context, and individual drive modulate effectiveness, aligning with Torheim *et al*.[14] emphasis on personalized educational approaches.

Another significant improvement was regularized meal patterns. Medical students' chaotic timetables often disrupt eating, adversely affecting metabolic health. The intervention's emphasis on consistent timing—promoting stable energy and enhanced health—directly addresses this prevalent issue among the student population.

The increased focus on proper hydration practices highlights the effectiveness of education in addressing often-overlooked aspects of nutrition. Dehydration can impair cognitive function and physical performance, which are critical for medical students. The intervention successfully encouraged students to prioritize water intake over sugary beverages. The incorporation of nutrition education into the medical curriculum has far-reaching implications. As future healthcare providers, MBBS students must understand the role of nutrition in disease prevention and management. Enhancing their dietary habits not only improves their personal health but also equips them to counsel patients effectively. Similar recommendations have been highlighted by Crowley *et al*.[15], who advocate for integrating nutrition competencies into medical training.

While the positive impact of nutrition education observed in this study aligns with global trends, the effect size appears more pronounced compared to similar interventions in non-medical student populations.[16] Similar studies globally have reported comparable outcomes, reinforcing the need for integrating nutrition education into medical curricula. A 2022 review by Patel *et al*. emphasized that nutrition education improves both theoretical knowledge and practical dietary behaviors among medical students. The findings of this study align with such evidence, underscoring the importance of targeted interventions.[17]

Several limitations warrant consideration. First, self-reported dietary assessments may introduce reporting bias. Second, the study's short duration and short sample size precludes evaluation of long-term adherence to improved dietary habits. Future longitudinal studies are necessary to address these gaps. Further research should explore the integration of hands-on activities, such as cooking workshops or meal planning exercises, to complement theoretical knowledge. Additionally, examining the role of peer-led education and digital tools in enhancing engagement could offer valuable insights.

In conclusion, nutrition education has a positive impact on the dietary habits of MBBS students and nutrition education is the best methods for enhancing students' eating habits and promoting healthier diets and lifestyles. This study found that significant and beneficial changes in dietary habits have been found for medical students after the implementation of nutrition interventions via various techniques. Integrating nutrition education into the MBBS curriculum can enhance dietary habits and prepare students to advocate for healthier lifestyles in their future clinical practice. Long-term benefits include healthier lifestyles and better professional advocacy for patient nutrition. Further studies with larger sample sizes and long-term follow-up are recommended.

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