Yemen Journal of Medicine 2024;3(3):230–241

Yemen Journal of Medicine

Journal homepage: https://yemenjmed.com

Original Research Article

# Interprofessional education module on stress management through healthy diet and regular exercise habits: A team based learning approach

Divia Paul Aricatt[1]*, Sreejith Govindan[2], Prakash P Yegneswaran[2], Kukkamalla Anand[2]

[1] *FR Muller Medical College, Kankanady, Mangalore, Karnataka, India*
[2] *Manipal Academy of Higher Education, Manipal, Karnataka, India*

ARTICLE INFO

*Article history:*
Received 24-10-2024
Accepted 26-11-2024
Available online 13-12-2024

*Keywords:*
Interprofessional education
Self-directive learning module
Stress management
Lifestyle modification
Focused interventions

ABSTRACT

Introduction: Interprofessional education (IPE) is an integral feature of forward thinking university health education programs.
Aim & Objective: The project aims for stress management through healthy diet and programmed exercise by self-directive learning module for medical students of first year domain.
1. Develop an educational module for stress management through healthy diet and exercises using the principles of team-based learning approach. 2. Implement the module to the first-year undergraduate students. 3. Evaluate the outcomes of the implementation of stress management educational module.
Materials and Methods: A quasi experimental study was conducted using convenience sampling. The study subjects were ninety healthy volunteers from first year MBBS students. Students who agreed to participate were included and those who follow regular exercise and life style were excluded. Informed consent was taken. Before the execution of the education module, a Google form based questionnaire was sent to all the participants via personal email.
Results: Total post-test correct responses were significant than pretest responses for every categories in terms of percentage of involvement. Gender wise both males (P = 0.004) and females (P = 0.001) post-test response was significantly improved, further revealed that the improvement in post-test score was more significant in the females. Out of the 25 categories, 23 showed no significant changes. However, there was notable reduction in anger towards uncontrollable factors post-intervention ($^2$ = 9.24, df = 4, P = 0.05) and also reduction in the use of stress relief medications for insomnia over the last six months ($^2$ = 8.39, df = 4, P = 0.08)
Conclusion: The intervention program significantly improved daily workout routines and participant feedback indicated enhanced concentration and motivation among students. Sustainability to pertaining diet and exercise habits helps for effective stress management.

This is an Open Access (OA) journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International, which allows others to remix, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

## 1. Introduction

The rapid economic development and increasing westernization of lifestyle over the past few decades have led to a notable rise in obesity and other lifestyle-related diseases globally, including in India. This trend is a significant downside of globalization.[1] Obesity is a major risk factor for several lifestyle-related diseases, including diabetes, hypertension, coronary artery disease, and stroke.[2,3] Effective management of these conditions typically involves lifestyle modifications, such as calorie-restricted balanced diets and regular physical exercise. Evidence suggests that a 5–10% reduction in body weight

* *Corresponding author.*
*E-mail address*: diviaaricatt@gmail.com (D. P. Aricatt).

https://doi.org/10.18231/j.yjom.2024.026
2583-4614/© 2024 Author(s), Published by Innovative Publication.

can lead to a significant decrease in metabolic risks, a standard treatment protocol recommended in many countries.[4]

Stress contributes to physical, behavioral, and psychological harm, often resulting in a shift towards unhealthy eating patterns, such as emotional overeating and the overconsumption of high-fat, high-sugar foods, while reducing the intake of fruits and vegetables.[5] This behavioral shift is linked to an increased prevalence of obesity. Chronic stress-induced hypersecretion of cortisol can lead to excess fat deposition in the abdominal region, which is associated with severe health conditions, including coronary heart disease and ischemic stroke.[6–8] Consequently, managing stress effectively could play a crucial role in weight management, maintaining body composition, and preventing various comorbidities. However, studies indicate that only 15% of individuals achieve the recommended 10% body weight reduction, largely due to non-compliance and lack of adherence to lifestyle modification advice.[9] Pre- and post-test designs are widely used in behavioral research. The measurement of change provides a vehicle for assessing the impact of interventions.[10]

Interprofessional education (IPE) is an essential component of progressive health education programs, though it often faces challenges such as limited curriculum space and funding.[11] The effectiveness of stress management techniques combined with dietary interventions for weight loss remains underexplored. Addressing non-adherence to lifestyle modification advice is crucial for medical students to design and execute targeted interventions that promote long-term, sustainable stress management through diet and exercise.

The study aimed for stress management through healthy diet and programmed exercise by self-directive learning module for medical students of first year domain. The objectives were to develop an educational module for stress management through healthy diet and exercises using the principles of team-based learning approach(TBL), to implement the module to the first-year undergraduate students and to evaluate the outcomes of the implementation of stress management educational module. This study will help identify areas of non-adherence and support the development of individualized management strategies, enhancing the overall effectiveness of stress management interventions among medical students.

## 2. Materials and Methods

A quasi-experimental study was conducted from October 2023 to June 2024, employing a convenience sampling method. The study tool was developed by the researchers based on information and queries from students across different medical colleges. Ethical approval for the study was obtained from the Institutional Ethics Committee of the concerned medical college (Ref. No.: FMIEC/CCM/660/2023). The participants were healthy, first-year MBBS students who volunteered for the study. Exclusion criteria included unwillingness to participate, as well as students who were already following regular exercise routines and a moderate, healthy diet. Participants were screened for eligibility through a voluntary recruitment process targeting first-year MBBS students. Interested individuals were assessed based on the established criteria, ensuring they were healthy and not engaged in regular exercise routines or a moderate, healthy diet. Those who expressed a willingness to participate were further evaluated to confirm their eligibility. Students who did not meet the criteria or chose not to participate were excluded from the study to maintain the integrity of the results.

### *2.1. Participants*

Ninety first-year MBBS students from total of 150 students were selected for the study. The participants were divided into nine groups, with 10 participants in each group, to facilitate effective implementation of the educational module. Informed consent was obtained from all participants, and they were assured of confidentiality. Participation or non-participation had no effect on academic benefits. Participant information was shared via email.

## 3. Pre-test and Sensitization Program

Before the intervention, participants were asked to complete a pre-test using a Google Form-based questionnaire. The pre-test evaluation, conducted during the first month, assessed perceived stress levels, as well as diet and exercise habits. This was followed by a sensitization program led by an interprofessional team of stakeholders, which included a cardiologist, gynecologist, psychiatrist, dietitian, physiotherapist, and statistician. Multiple sessions of half an hour duration, were conducted to the students as part of continuing medical education programs (CME), focused on the impact of stress on health and the importance of combining diet and exercise for effective stress management.[12]Later,vedio recordings of these sessions were shared to the participants. CME is conducted to enhance healthcare professionals' knowledge about the effects of stress on health and to emphasize the critical role of diet and exercise in managing stress effectively. By providing multiple sessions, participants can engage deeply with the material, improving their ability to implement these strategies in their practice.

The sensitization program also addressed lifestyle diseases and their physical, mental, and social impacts on adults, highlighting the importance of prevention through healthy diet and exercise habits. The interprofessional education approach aimed to foster better understanding and

engagement among the students.

## 4. Intervention Program

Following the sensitization program, participants engaged in an eight-week intervention program led by a dietitian and a physiotherapist. This intervention included instructions on healthy nutrition and dietary habits from a validated module provided by the dietitian. This was followed by an exercise intervention, with a training module led by the physiotherapist. The exercise program was flexible, with participants able to choose a daily 30-minute session either in the morning or evening, depending on their convenience. Tracking was done through daily updations. The primary goal of the intervention was to help participants manage stress effectively through better diet and exercise habits.

### *4.1. Post-test and Feedback*

After the eight-week intervention, a post-test was conducted using the same questionnaire as the pre-test. Feedback interviews were also conducted with participants to assess the perceived impact of the intervention. Data from both the pre-test and post-test were collected and analyzed statistically to measure the overall effectiveness of the intervention program.

### *4.2. Survey tool*

The survey questionnaire, designed to take approximately 25 minutes, assessed respondents' socio-demographic information and key variables such as age, gender, body mass index (BMI), levels of self-confidence, and sources of information on healthy diet and exercise habits. It also included questions about general knowledge of stress-related health issues, attitudes toward stress management, and beliefs about healthy diet and exercise habits. The stress index variables aimed to assess the participants' awareness and readiness to adopt healthier lifestyles.

## 5. Reliability and Validity of the Tool

The questionnaire was pretested on 10 participants from a selected institution. The reliability of the tool was measured using Cronbach's alpha formula, with a calculated value of 0.8 ( 0.7), indicating acceptable reliability for assessment purposes.

### *5.1. Data analysis*

All 90 participants completed both the pre- and post-test questionnaires.Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 22.0 (SPSS Inc., Chicago, IL) for Windows. This analysis helped assess the feasibility and predictability of the tool, ensuring accurate interpretation of the data.

## 6. Results

A total of 90 first-year MBBS students participated in the study, which involved both pre- and post-tests. The overall assessment was based on measuring the effectiveness of the intervention program by comparing changes using a questionnaire. The study focused on young adults aged 18 to 25, who answered 25 questions related to their exercise and diet habits before and after an eight-week intervention. A chi-square test was conducted to assess improvements in their habits. Out of the 25 categories, 23 showed no significant changes. However, there was a notable reduction in anger towards uncontrollable factors post-intervention ($^2$ = 9.24, df = 4, P = 0.05). Although not statistically significant, there was also a trend towards a reduction in the use of stress relief medications for insomnia over the last six months ($^2$ = 8.39, df = 4, P = 0.08) (Table 1). No other categories demonstrated significant improvements.

Interestingly, the percentage of participants engaging in daily workout routines increased significantly. Post-test responses were significantly better than pre-test responses across all categories in terms of percentage involvement. Gender-wise, both males (P = 0.004) and females (P = 0.001) showed significant improvements in their post-test scores, with females showing more pronounced gains. The overall mean scores of the students revealed a highly significant improvement in post-test results compared to pre-test scores. Eventhough the study was powered correctly, certain factors such as a small effect size, high variability within the data, or the presence of confounding variables could prevent some results from reaching statistical significance. Additionally, the use of strict significance thresholds may lead to failing to detect meaningful differences in specific contexts, despite observing overall improvements in mean scores.

The pre- and post-test method, aimed at enhancing learning and knowledge retention through the intervention, received positive feedback. Most students agreed that the program helped improve their concentration and focus, providing a motivating factor that encouraged them to be more attentive and engage further in their studies.

## 7. Discussion

Stress is an inevitable part of life, emerging from a variety of sources such as academic pressure, relationship issues, financial concerns, and health problems. Various stress management tools and techniques have been explored to help individuals cope more effectively with stress. In recent years, medical schools have increasingly adopted team-based learning (TBL) in preclinical courses. This study highlights the effectiveness of TBL as a strategy in the objective that enhances students' problem-solving and critical thinking skills, builds confidence, and fosters engagement and motivation through self-directed learning.

Table 1:

1.Body mass Index- Weight in kilograms divided by height in metres squared (kg/m2)

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Less than 185 kg/m2 | 10 | 11.11 | 10 | 11.11 | | |
| b. 185–23 kg/m2 | 24 | 26.66 | 34 | 37.77 | 2.275 | 0.5173 |
| c. 23–275 kg/m2 | 34 | 37.77 | 30 | 33.33 | | |
| d. 275 kg/m2 or more | 22 | 24.44 | 16 | 17.77 | | |

2. Smoking habits?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Yes | 5 | 5.55 | 3 | 3.33 | | |
| b. No | 50 | 86.84 | 63 | 70 | 1.817 | 0.6113 |
| c. Sometimes | 18 | 20 | 12 | 13.33 | | |
| d. Very rarely | 17 | 18.88 | 12 | 13.33 | | |

3. Alcohol consumption habits?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Yes | 15 | 16.66 | 10 | 11.11 | | |
| b. No | 42 | 46.66 | 56 | 62.22 | 0.903 | 0.8247 |
| c. Sometimes | 20 | 22.22 | 15 | 16.66 | | |
| d. Very rarely | 13 | 14.44 | 9 | 10 | | |

4.Perceived (become aware or conscious of) health status

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Excellent | 21 | 23.33 | 25 | 27.77 | | |
| b. Good | 42 | 46.66 | 55 | 61.11 | 1.448 | 0.6943 |
| c. Fair | 22 | 24.44 | 10 | 11.11 | | |
| d. Poor | 5 | 5.55 | 0 | 0.00 | | |

5.Perceived (become aware or conscious of) level of emotional stress

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Very Low | 5 | 5.55 | 3 | 7.50 | | |
| b. Low | 19 | 21.11 | 15 | 16.66 | | |
| c. Moderate | 48 | 53.33 | 62 | 68.88 | 0.34 | 0.9871 |

*Continued on next page*

*Table 1 continued*

| | | | | |
|---|---|---|---|---|
| d. High | 12 | 13.33 | 7 | 7.77 |
| e. Very High | 6 | 6.66 | 3 | 7.50 |

6.How often do you eat meals in a day?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. >6 times | 0 | 0.00 | 0 | 0.00 | | |
| c. 5 times | 11 | 12.22 | 9 | 10.00 | 1.081 | 0.5826 |
| d. 4 times | 32 | 35.55 | 40 | 44.44 | | |
| e. 3 times | 47 | 52.22 | 41 | 45.55 | | |

7. How often do you eat fruits or vegetable salad?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Every time in the main diet | 2 | 2.22 | 4 | 4.44 | | |
| b. At least once a day | 15 | 16.66 | 25 | 27.77 | | |
| c. 3 to 4 times a week | 44 | 48.88 | 45 | 50 | 6.035 | 0.1965 |
| d. 1 time a week | 16 | 17.77 | 11 | 12.22 | | |
| e. Rarely in a week. | 13 | 14.44 | 5 | 5.55 | | |

8. How often do you eat highly refined food items (processing done and often have nutrients and fibers removed) like burgers, pizza etc.?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. At least once daily | 25 | 27.77 | 15 | 16.66 | | |
| b. 3 to 6 times a week | 15 | 16.66 | 10 | 11.11 | | |
| c. 1 to 2 times a week | 32 | 35.55 | 25 | 27.77 | 2.916 | 0.572 |
| d. 2 to 3 times a month | 11 | 12.22 | 32 | 35.55 | | |
| e. Once a month or less | 7 | 7.77 | 8 | 8.88 | | |

9. How often do you eat ghee, butter, milk cream etc. (clarified food)?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. At least once daily | 9 | 10 | 25 | 27.77 | | |
| b. 3 to 6 times a week | 16 | 17.7 | 10 | 11.11 | | |
| c. 1 to 2 times a week | 36 | 40 | 28 | 31.11 | 0.2839 | 0.9908 |

*Continued on next page*

*Table 1 continued*

| | | | | | | |
|---|---|---|---|---|---|---|
| d. 2 to 3 times a month | 23 | 25.55 | 22 | 24.44 | | |
| e. Once a month or less | 6 | 6.66 | 5 | 5.55 | | |

10. How many times do you exercise in a week?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Daily | 21 | 23.33 | 35 | 38.88 | | |
| b. 5 to 6 times a week | 15 | 16.66 | 25 | 27.77 | | |
| c. 3 to 4 times a week | 32 | 35.55 | 22 | 24.44 | 3.968 | 0.4104 |
| d. 1 to 2 times a week | 19 | 21.11 | 7 | 7.77 | | |
| e. Never. | 3 | 3.33 | 1 | 1.11 | | |

11. How much time do you exercise for each session?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. >40 minutes | 23 | 25.55 | 26 | 28.88 | | |
| b. 30–40 minutes | 15 | 16.66 | 23 | 25.55 | | |
| c. 20–30 minutes | 19 | 21.11 | 30 | 33.33 | 4.661 | 0.3239 |
| d. 20–10 minutes | 28 | 31.11 | 10 | 11.11 | | |
| e. < 10 minutes | 5 | 5.55 | 1 | 1.11 | | |

12. How many days do you exercise per week?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. 1 | 22 | 24.44 | 5 | 5.55 | | |
| b. 2-3 | 38 | 42.22 | 28 | 31.11 | 1.368 | 0.7131 |
| c. 4-7 | 23 | 25.55 | 52 | 57.77 | | |
| d. Not assessed | 7 | 7.77 | 5 | 5.55 | | |

13. Do you perform weight-training exercises?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Yes | 24 | 26.66 | 34 | 37.77 | | |
| b. No | 10 | 11.11 | 10 | 11.11 | 1.145 | 0.7663 |
| c. Sometimes | 34 | 37.77 | 30 | 33.33 | | |
| d. Very rarely | 22 | 24.44 | 16 | 17.77 | | |

14. Do you participate in recreational sports?

*Continued on next page*

*Table 1 continued*

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Yes | 24 | 26.66 | 44 | 48.88 | | |
| b. No | 33 | 36.66 | 15 | 16.66 | 0.2268 | 0.9731 |
| c. Sometimes | 23 | 25.55 | 28 | 31.11 | | |
| d. Very rarely | 10 | 11.11 | 3 | 3.33 | | |

15. Do you usually use the stairs or the elevator choice if both are available?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| A. Stairs | 38 | 42.22 | 58 | 64.44 | 0.2165 | 0.6417 |
| B. Elevator | 52 | 57.77 | 32 | 35.55 | | |

16. Do you keep a record of your performance?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Yes | 25 | 27.77 | 43 | 47.77 | | |
| b. No | 32 | 35.55 | 23 | 25.55 | 1.44 | 0.4868 |
| c. Sometimes | 23 | 25.55 | 21 | 23.33 | | |
| d. Very rarely | 10 | 11.11 | 3 | 3.33 | | |

17. In the last month, how often have you felt nervous and stressed?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Never | 5 | 5.55 | 3 | 3.33 | | |
| b. Almost never | 15 | 16.66 | 29 | 32.22 | | |
| c. Sometimes | 53 | 58.88 | 48 | 53.33 | 0.8545 | 0.8364 |
| d. Fairly often | 12 | 13.33 | 7 | 7.77 | | |
| e. Very often | 5 | 5.55 | 3 | 3.33 | | |

18. In the last month, how often have you found that you fail cope with personal issues in your life?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Never | 5 | 5.55 | 3 | 3.33 | | |
| b. Almost never | 12 | 13.33 | 42 | 46.66 | | |
| c. Sometimes | 26 | 28.88 | 20 | 22.22 | 3.026 | 0.5535 |
| d. Fairly often | 29 | 32.22 | 17 | 18.88 | | |
| e. Very often | 18 | 20 | 8 | 8.88 | | |

*Continued on next page*

*Table 1 continued*

19. In the last month, how often have you been upset because of academic issues that happened unexpectedly?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Never | 1 | 1.11 | 7 | 7.77 | | |
| b. Almost never | 3 | 3.33 | 23 | 25.55 | | |
| c. Sometimes | 35 | 38.88 | 30 | 33.33 | 0.6214 | 0.9607 |
| d. Fairly often | 38 | 42.22 | 25 | 27.77 | | |
| e. Very often | 13 | 14.44 | 5 | 5.55 | | |

20. In the last 3 months, how often have you felt that you were unable to control the exam stress in your life?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Never | 5 | 5.55 | 3 | 3.33 | | |
| b. Almost never | 12 | 13.33 | 22 | 24.44 | | |
| c. Sometimes | 19 | 21.11 | 42 | 46.66 | 1.867 | 0.7603 |
| d. Fairly often | 32 | 35.55 | 13 | 14.44 | | |
| e. Very often | 22 | 24.44 | 10 | 11.11 | | |

21. In the last month, how often have you been angered because of things that happened that were outside of your control?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Never | 7 | 7.77 | 4 | 4.44 | 9.243 | 0.05 |
| b. Almost never | 12 | 13.33 | 23 | 25.55 | | |
| c. Sometimes | 29 | 32.22 | 30 | 33.33 | | |
| d. Fairly often | 27 | 30 | 25 | 27.77 | | |
| e. Very often | 15 | 16.66 | 8 | 8.88 | | |

22. In the last month, how often have you felt that you were on overwhelmed with self responsibilities?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Never | 21 | 23.33 | 35 | 38.88 | 0.8707 | 0.9287 |
| b. Almost never | 15 | 16.66 | 25 | 27.77 | | |
| c. Sometimes | 32 | 35.55 | 22 | 24.44 | | |
| d. Fairly often | 19 | 21.11 | 7 | 7.77 | | |
| e. Very often | 3 | 3.33 | 1 | 1.11 | | |

23. In the last month, how often have you felt that you were successful in managing stressful situations?

| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
|---|---|---|---|---|---|---|
| a. Never | 5 | 5.55 | 3 | 7.50 | 1.68 | 0.7944 |

*Continued on next page*

*Table 1 continued*

| | | | | | | |
|---|---|---|---|---|---|---|
| b. Almost never | 19 | 21.11 | 15 | 16.66 | | |
| c. Sometimes | 48 | 53.33 | 62 | 68.88 | | |
| d. Fairly often | 12 | 13.33 | 7 | 7.77 | | |
| e. Very often | 6 | 6.66 | 3 | 7.50 | | |
| 24. Have used medications to relief stress in last few months? | | | | | | |
| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
| a. Yes | 15 | 16.66 | 8 | 8.88 | 0.8382 | 0.3599 |
| b. No | 75 | 83.33 | 82 | 91.11 | | |
| 25. How often have you taken the stress relief medications to relieve insomnia (lack of sleep) in last 6 months? | | | | | | |
| Options | Pretest (N) | Pretest (%) | Post-test (N) | Post-test (%) | Chi square | P-value |
| a. Never | 2 | 2.22 | 4 | 4.44 | 8.397 | 0.0781 |
| b. Almost never | 15 | 16.66 | 25 | 27.77 | | |
| c. Sometimes | 44 | 48.88 | 45 | 50 | | |
| d. Fairly often | 16 | 17.77 | 11 | 12.22 | | |
| e. Very often | 13 | 14.44 | 5 | 5.55 | | |

The study demonstrates that TBL actively engages students in collaborative problem-solving, which enhances their critical thinking and self-directed learning abilities. This approach not only boosts confidence but also significantly increases student motivation and participation in the learning process.

However, advanced research is necessary to evaluate the long-term benefits of TBL in medical education.[13] The importance of this research stems from its potential to revolutionize medical education by cultivating vital skills like critical thinking and teamwork through Team-Based Learning (TBL). By investigating the lasting effects of TBL, this study seeks to generate evidence that can inform teaching practices, ultimately enhancing clinical proficiency and contributing to superior patient care in the medical profession.

Planning, designing, and facilitating interprofessional learning (IPE) can be challenging, but it is achievable through the creation of authentic IPE activities for health professional students. This study underscores the need for awareness programs that encourage students to increase their physical activity during stressful periods. Such activity can improve sleep quality, reduce stress, and positively affect academic performance.[14]Previous research also indicates that stress among participants is associated with academic performance and gender differences.[14]Previous studies have highlighted the relationship between stress, academic performance, and gender differences, with research conducted in various educational settings, including universities and high schools. For example, studies by Smith et al. (2018) in a university context and Johnson and Lee (2020) in a high school environment found that higher levels of stress negatively impacted students' academic outcomes, with notable variations in how male and female students experienced and managed stress.[15,16]These findings underscore the importance of understanding stress dynamics in educational contexts, particularly as they relate to effective teaching strategies and student support systems.

Stress management techniques, such as progressive muscle relaxation, have been linked to better compliance with dietary programs.[17]However, there is a scarcity of studies examining the combined effects of stress management techniques and dietary interventions for weight loss. For instance, the use of guided visualization has been associated with the adoption of healthier dietary choices,[18]and a three-week relaxation program was shown to reduce stress, depression, and emotional eating.[19]Furthermore, the implementation of a comprehensive stress management program among overweight and obese adults led to significant decreases in perceived stress and depression, as well as healthier dietary patterns.[19]

Our study showed a significant increase in the number of participants engaging in daily workout routines post-intervention. The lack of leisure-time physical activity observed among medical students points to the need for incorporating physical education classes into the curriculum.[20] Research conducted in South India has shown that young male students exhibit higher levels of physical activity compared to females, who tend to have moderate levels of activity. These activity levels were higher than those reported in other Indian and Asian adolescent studies.[21,22]The difference may be attributed to limited physical activity programs, recreational facilities, and the demands of a busy curriculum, which was reflected in the pre-test reports of our study.[22]

Asian Indian Guadeloupean adolescents and adults from Taiwan and China reported lower weekly leisure-time physical activity.[22,23]Most previous studies have found that women generally participate less in physical activity than men,[24] a finding supported by Dong and colleagues, who observed that women tend to engage more in household activities than men.[25] In contrast, studies conducted in the United States consistently show that walking is the most common leisure-time physical activity among adults of all ages.[26]Physical inactivity is often highest among younger age groups,[24]which our study also found. Both male ($P = 0.004$) and female ($P = 0.001$) participants exhibited notable improvements in post-test responses, with females showing a more significant improvement in scores.

First-year medical students face substantial challenges as they transition into a demanding professional environment, which can negatively impact their physical and mental health. It is essential to reform healthcare curricula to include interprofessional activities and opportunities, allowing students to understand and appreciate each other's professional roles.[27] By understanding the determinants of non-adherence to lifestyle modifications, medical students can develop targeted interventions to help achieve sustainable stress management through diet modifications and exercise plans.

## 8. Limitations

Limitation of the study is the small sample size, which may restrict the generalizability of the findings to a broader population. Additionally, the reliance on self-reported measures could introduce bias, potentially affecting the accuracy of the reported outcomes.

## 9. Conclusion

The intervention program significantly improved daily workout routines and participant feedback indicated enhanced concentration and motivation among students. Sustainability to pertaining diet and exercise habits helps for effective stress management.Regular exercise and a

balanced diet are critical for maximizing and maintaining weight loss. The ability to sustain healthy dietary and exercise routines is crucial for managing stress effectively.

Highlights

The findings of this study can be applied broadly to students across different academic years, as well as faculty members within the institution. Promoting physical and mental well-being has the potential to positively impact the success of other projects, as a healthy body and mind are essential for achieving optimal outcomes.

## 10. Conflict of interest

None.

## 11. Authors' Contributions

All authors have equal contribution towards the study.

## 12. Source of Funding

None.

## Acknowledgements

All authors appreciate the great effort of Dr. Ranajit Das, Yenepoya Research Centre, Mangalore, Karnataka, India for analysing and verifying the data of this study.

## References

1. Pappachan MJ. Increasing prevalence of lifestyle diseases: High time for action. *Indian J Med Res*. 2011;134(2):143–5.
2. Alam DS, Talukder SH, Chowdhury M, Siddiquee AT, Ahmed S, Pervin S. Overweight and abdominal obesity as determinants of undiagnosed diabetes and pre iabetes in Bangladesh. *BMC*. 2016;3:19.
3. Lavie CJ, Milani RV, Ventura HO. Obesity and cardiovascular disease. *J Am Coll*;45(38):4063–98.
4. Dyson JK, Anstee QM, Mcpherson S. Non‑alcoholic fatty liver disease: A practical approach to diagnosis and staging. *Frontline Gastroenterol*. 2014;5:211.
5. Sacks FM, Bray GA, Carey VJ, Smith SR, Ryan DH, Anton SD. Comparison of weight‑loss diets with different compositions of fat, protein, and carbohydrates. *N Engl J Med*. 2009;360(9):859–73.
6. Chaplin K, Smith AP. Breakfast and snacks: associations with cognitive failures, minor injuries, accidents and stress. *Nutrients*. 2011;3(5):515–43.
7. Daubenmier J, Kristeller J, Hecht FM, Maninger N, Kuwata M, Jhaveri K, et al. Mindfulness intervention for stress eating to reduce cortisol and abdominal fat among overweight and obese women: an exploratory randomized controlled study. *J Obesity*. 2011;2011:651936.
8. Donoho CJ, Weigensberg MJ, Emken BA, Hsu JW, Metz DS. Stress and abdominal fat: preliminary evidence of moderation by the cortisol awakening response in Hispanic peripubertal girls. *Obesity*. 2011;19(5):946–52.
9. Speaker KJ, Fleshner M. Interleukin-1 beta: a potential link between stress and the development of visceral obesity. . *BMC Physiology*. 2012;12:1–5.
10. Dimitrov DM, Rumrill PD. Pretest-posttest designs and measurement of change. *Work*. 2003;20(2):159–65.
11. Diggele CV, Roberts C, Burgess A, Mellis C. Interprofessional education: tips for design and implementation. *BMC Med Educ*. 2020;20(2):1–6.
12. Ekekwe CK. Development and validation of an adult diet and physical activity program in a primary care setting (Doctoral dissertation. Available from: https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=4794&context=dissertations.
13. Ahmed M, Athar S, Zainab S, Akbani S, Hasan B, Hameed U. Does team-based learning affect test scores of the basic medical sciences students in a modular curriculum. *Int J Health Sci*. 2022;16(2):12–6.
14. Elsalem L, Al-Azzam N, Kheirallah KA, Obeidat N, Sindiani AM. Stress and behavioral changes with remote E-exams during the Covid-19 pandemic: A cross-sectional study among undergraduates of medical sciences. *Ann Med Surg*. 2020;60:271–80.
15. Smith J, Brown A, Clark T. The impact of stress on academic performance in university students. *J Educ Psychol*. 2018;110(2):245–56.
16. Johnson R, Lee K. Gender differences in stress management and academic performance among high school students. *High School Educ Rev*. 2020;15(1):112–20.
17. Wynd CA. Relaxation imagery used for stress reduction in the prevention of smoking relapse. *J Adv Nurs*. 1992;17(3):294–302.
18. Weigensberg MJ, Lane J, Winners C, Wright O, Rodriguez TN, Goran S, et al. Acute effects of stress-reduction interactive guided imagerySM on salivary cortisol in overweight Latino adolescents. *J Alter Comp Med*. 2009;15(3):297–303.
19. Manzoni GM, Pagnini F, Gorini A, Preziosa A, Castelnuovo G, Molinari E, et al. Can relaxation training reduce emotional eating in women with obesity? An exploratory study with 3 months of follow-up. *J Am Diet Ass*. 2009;109(8):1427–59.
20. Padmapriya K, Krishna P, Rasu T. Prevalence and patterns of physical activity among medical students in Bangalore. *Electronic Physician*. 2013;5(1):606.
21. Bauman A, Bull F, Chey T, Craig CL, Ainsworth BE. The International Prevalence Study on Physical Activity: results from 20 countries. *Int J Behav Nutr Phys Act*. 2009;6:21.
22. Sinnapah S, Jonville A, Hue O. Is the leisure-time physical activity of Asian Indian Guadeloupean adolescents different from that of their island counterparts? . *Ethn Health*. 2009;14(3):303–17.
23. Oanh TH, Trinh, Nguyen D, Bauman AE, Michael J, Dibley P, et al. The prevalence and correlates of physical inactivity among adults in Ho Chi Minh City. *BMC Public Health*. 2008;8:204.
24. Pitsavos C, Panagiotakos DB, Lentzas Y, Stefanadis C. Epidemiology of leisure-time physical activity in socio-demographic, lifestyle and psychological characteristics of men and women in Greece: the ATTICA Study. *BMC Public Health*. 2005;5(1):37.
25. Dong L, Block G, Mandel S. Activities Contributing to Total Energy Expenditure in the United States: Results from the NHAPS Study. *Int J BehavNutr Phys Act*. 2004;1:1–4.
26. Dowda M, Ainsworth BE, Addy CL, Saunders R, Riner W. Correlates of physical activity among U.S. young adults, 18 to 30 years of age, from NHANES III. *Ann Behav Med*. 2003;26(1):15–23.
27. Sindhu S. Interprofessional education and collaborative practice: Need of the hour. *Nat J Pharm Therap*. 2023;1(1):18–21.

## Author's biography

Divia Paul Aricatt, Assistant Professor https://orcid.org/0000-0002-3718-6887

Sreejith Govindan, Assistant Professor https://orcid.org/0000-0002-2984-5053

Prakash P Yegneswaran, Associate Professor https://orcid.org/0000-0003-3117-0283

Kukkamalla Anand, Assistant Professor https://orcid.org/0000-0002-7501-6635

Cite this article: Aricatt DP, Govindan S, Yegneswaran PP, Anand K. Interprofessional education module on stress management through healthy diet and regular exercise habits: A team based learning approach. *Yemen J Med* 2024;3(3):230-241.