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An Experimental Study of Healthy Diet and Physical Activity on Students

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ABSTRACT

Purpose. To study the effect of a healthy diet and physical activity program. Method A pre-experimental and post-experimental single group study design. Set up: The study was conducted at an educational institution in Bhopal, Madhya Pradesh. Results: A total of 200 students participated in the study. **Result.** Dietary habits were assessed using different food components before and after the intervention. Healthy food intake such as milk increased from (1.92) to (2.625), vegetables from (2.97) to (3.40), fruits from (1.4795) to (2.2715), cereals from (2.987) to (5.02), and pulses from (1.985) to (2.2794). All these improvements were statistically significant with high t-values ($p<0.05$). Flesh group consumption slightly decreased from (0.4364) to (0.3676) but was still significant. However, bakery/snacks/sweets (0.3815 to 0.3384), fast food (0.2163 to 0.2005), and nuts (0.3216 to 0.3506) showed non-significant changes, indicating limited impact of intervention on these items. Physical activity also improved significantly. Minutes of activity increased from (158.21) to (182.34) with a t-value of (4.6), and METs increased from (671.18) to (767.95) with a t-value of (2.7), both statistically significant at 0.05 level. This indicates improvement in both duration and intensity of physical activity. **Conclusions.** The study concludes that an healthy diet combined with physical activity significantly improves dietary habits and physical activity levels.

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INTRODUCTION

In today's modern lifestyle, maintaining a healthy balance between dietary practices and physical activity has become a significant challenge, particularly among students and young adults. Rapid urbanization, demanding academic schedules, and the widespread availability of processed and fast foods have contributed to unhealthy eating habits and declining levels of physical activity (Guthold et al., 2018; Bull et al., 2020). These lifestyle changes are closely associated with an increased prevalence of obesity, reduced physical fitness, fatigue, and poor overall well-being (Lee et al., 2012; Afshin et al., 2019). Consequently, investigating the combined effect of a healthy diet and physical activity program on dietary habits and physical activity levels has become increasingly important (Plotnikoff et al., 2015). A healthy diet is fundamental to maintaining optimal physiological functioning and overall health. It provides essential nutrients, including carbohydrates, proteins, fats, vitamins, and minerals, which are necessary for growth, energy production, tissue repair, and disease prevention (Mozaffarian, 2016). A balanced diet consisting of milk, fruits, vegetables, whole grains, cereals, and pulses contributes to improved immunity, enhanced energy levels, and better physical performance (Aune et al., 2017). In contrast, frequent consumption of ultra-processed foods, bakery products, sugar-sweetened beverages, and fast foods is associated with poor nutritional status, increased risk of chronic diseases, and diminished

physical fitness (Monteiro et al., 2019; Afshin et al., 2019). Therefore, promoting healthy dietary habits is an essential strategy for improving health and physical fitness.

Regular physical activity is another essential component of a healthy lifestyle. It improves cardiovascular endurance, muscular strength, flexibility, body composition, and overall functional capacity (Warburton & Bredin, 2017; Reiner et al., 2013). In addition to its physical benefits, regular exercise reduces stress, improves mental health, enhances cognitive performance, and increases quality of life (Warburton & Bredin, 2017). Physical activity is commonly assessed based on duration (minutes per week) and intensity, often expressed as Metabolic Equivalent of Task (MET), with higher MET values indicating greater energy expenditure (Bull et al., 2020). However, many students fail to achieve the recommended levels of physical activity because of sedentary lifestyles, prolonged screen time, and academic pressures (Guthold et al., 2018; Hallal et al., 2012). Current evidence suggests that combining a healthy diet with regular physical activity provides greater health benefits than focusing on either component alone (Plotnikoff et al., 2015; Belogianni & Baldwin, 2019). Lifestyle intervention programs integrating nutrition education and exercise have demonstrated significant improvements in dietary behaviors, physical activity participation, body composition, and overall physical fitness among university students (Belogianni & Baldwin, 2019; Thomas et al., 2026). Moreover, health promotion interventions implemented in educational settings encourage sustainable behavioral changes that contribute to lifelong healthy lifestyles (Abu-Moghli et al., 2010).

The present study examines the effects of a structured healthy diet and physical activity program on dietary habits and physical activity levels among students. A pre-test and post-test research design is employed to evaluate changes following the intervention. Dietary habits are assessed using various food consumption components, while physical activity levels are measured in terms of activity duration (minutes) and energy expenditure expressed as METs (Bull et al., 2020). This approach enables a comprehensive assessment of the intervention's effectiveness in promoting healthier lifestyle behaviors. This study is expected to provide empirical evidence regarding the effectiveness of integrated healthy diet and physical activity interventions in improving students' dietary habits and physical activity levels. The findings may assist educators, health professionals, and policymakers in designing evidence-based health promotion programs for educational institutions (Community Preventive Services Task Force, 2021). Furthermore, the study contributes to the growing body of literature emphasizing that lifestyle modification through healthy eating and regular physical activity is an effective strategy for enhancing physical fitness, promoting wellness, and preventing lifestyle-related diseases (Lee et al., 2012; Warburton & Bredin, 2017).

METHOD

Research Design The study followed a pre-experimental and post-experimental single group design to evaluate the effect of an intervention on physical activity levels. Participants A total of participants (sample size as per study) were selected using a convenient sampling technique. The participants belonged to a similar age group and background to maintain uniformity in the study. Study Setting was conducted in a controlled environment such as an educational or institutional setup where regular monitoring of participants was possible. Variables are Independent Variable which are Structured physical activity intervention program and Dependent Variables are Minutes of physical activity, METs (Metabolic Equivalent of Task). Data Collection Tools Physical activity levels were measured using a standardized questionnaire or scale that records time spent in physical activity (minutes) and energy expenditure (METs). Procedure involved Initially, pre-test data were collected to record baseline values of physical activity (minutes and METs). After this, participants underwent a planned intervention program focused on increasing physical activity levels for a specific duration. At the end of the intervention period, post-test data were collected using the same tools and procedures to ensure consistency. Statistical Analysis included the collected data were analyzed using mean and standard deviation to describe the data. A paired t-test was applied to compare pre-test and post-test scores. The level of significance was set at 0.05.

RESULT AND DISCUSSIONS

Research Result

TABLE 1 : Pre Tests And Post Test Of Healthy Diet Of Students (n=200)

Food Component	Statistics	Pre-Test Score	Post-Test Score	Sigma D	t-value	Significance (0.05)
Milk	M	1.92	2.625	0.04	8.625	Significant
	SD	0.460	0.50			
Vegetables	M	2.97	3.400	0.03	11.62	Significant
	SD	0.30	0.464			

Fruits	M	1.4795	2.2715	0.04	19.8	Significant
	SD	0.458	0.354			
Cereals	M	2.987	5.02	0.13	14.83	Significant
	SD	1.50	1.29			
Pulses	M	1.985	2.2794	0.10	2.944	Significant
	SD	1.033	1.001			
Flesh Group	M	0.4364	0.3676	0.021	3.27	Significant
	SD	0.222	0.212			
Bakery/ Snacks/ Sweets	M	0.3815	0.3384	0.030	1.436	Non significant
	SD	0.405	0.1429			
Fast Food	M	0.2163	0.2005	0.01	1.11	Non significant
	SD	0.129	0.090			
Nuts	M	0.3216	0.3506	0.025	1.16	Non significant
	SD	0.210	0.297			

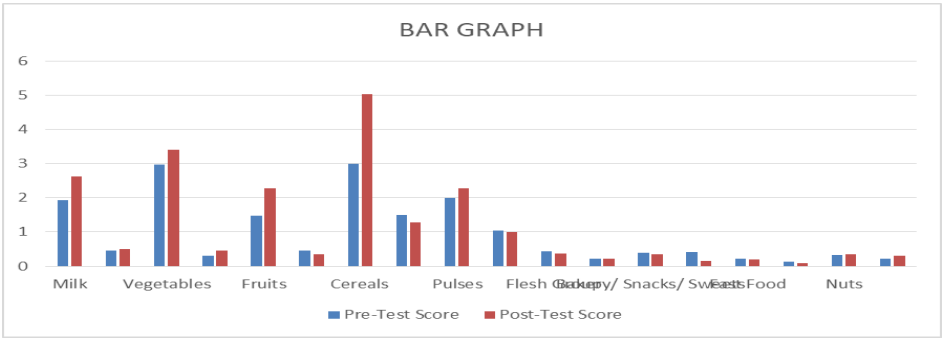

FIGURE 1: Pre Tests And Post Test Of Healthy Diet Of Students (n=200)

Interpretation

The table shows the comparison of **pre-test and post-test scores** of different food components along with their **t-values** and level of significance at 0.05. It helps to understand whether there is any improvement in dietary habits after the intervention. For **milk**, the mean value increased from 1.92 to 2.625. The t-value (8.625) is high and the result is significant, which shows a clear improvement in milk consumption. For **vegetables**, the mean increased from 2.97 to 3.40 with a high t-value (11.62), indicating a significant improvement in vegetable intake. Similarly, **fruits** show a strong increase from 1.4795 to 2.2715, with a very high t-value (19.8), showing a highly significant improvement. **Cereals** also show a large increase (2.987 to 5.02) with a high t-value (14.83), indicating a strong positive change. **Pulses** show a moderate increase (1.985 to 2.2794) and are also statistically significant (t = 2.944). However, **flesh group** consumption slightly decreased (0.4364 to 0.3676), but the change is still statistically significant (t = 3.27). On the other hand, **bakery/snacks/sweets**, **fast food**, and **nuts** show small changes with low t-values (1.436, 1.11, 1.16 respectively), which are **not significant**. This means the intervention did not have much effect on these food items. The results show that healthy food items like milk, vegetables, fruits, cereals, and pulses improved significantly, while unhealthy or less important food items did not change much. This indicates that the intervention was effective in improving healthy eating habits.

Table 2. Pre Tests And Post Test Of Physical Activity Of Students (n=200)

Variable	Pre Mean	Pre SD	Post Mean	Post SD	Sigma d	t-value	Significance Level
Minutes	158.21	49.08	182.34	55.64	5.2	4.6	SIGNIFICANT
METs	671.18	330.58	767.95	375.90	35.3	2.7	SIGNIFICANT

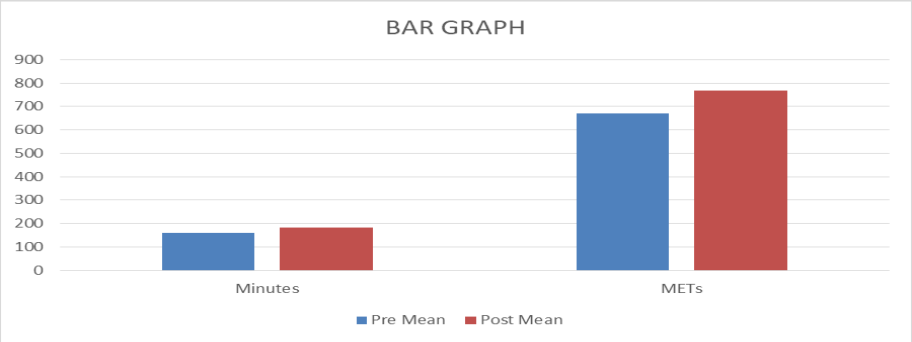

Figure 2. Pre Tests And Post Test Of Physical Activity Of Students (n=200)

Interpretation

The table shows the comparison of **pre-test and post-test values** for physical activity variables, along with their **t-values** and level of significance. For **minutes of physical activity**, the mean value increased from **158.21 (pre-test)** to **182.34 (post-test)**. This shows that participants spent more time doing physical activity after the intervention. The t-value is **4.6**, which is statistically significant at the 0.05 level. This means the increase in activity time is real and not due to chance. For **METs (Metabolic Equivalent of Task)**, the mean value increased from **671.18 (pre-test)** to **767.95 (post-test)**. This indicates that the overall intensity and energy expenditure of physical activity improved after the intervention. The t-value is **2.7**, which is also statistically significant, showing a meaningful improvement.

Both variables (minutes and METs) show a **significant increase after the intervention**, which means participants became more physically active and also performed activities with higher intensity. This clearly indicates that the intervention was effective in improving both the duration and level of physical activity.

Outcome Measure: The results showed a **significant improvement** in both minutes of physical activity and METs, indicating that the intervention was effective in increasing both the duration and intensity of physical activity among participants.

CONCLUSSION

The results of the study clearly show that the healthy diet and exercise intervention had a positive effect of students. In Dietary Components, there is a clear improvement in healthy food intake. The mean values of milk, vegetables, fruits, cereals, and pulses increased after the intervention, and all these changes are statistically significant ($p < 0.05$). This means the improvement is real and not due to chance. Among these, fruits and cereals showed the highest improvement, which indicates that students adopted healthier eating habits. The flesh group showed a slight decrease, but it was still significant, suggesting a controlled intake. However, items like bakery products, fast food, and nuts did not show significant changes, meaning students did not reduce these foods much.

In Physical Activity, both minutes of activity and METs increased significantly. The increase in minutes (158.21 to 182.34) shows that students spent more time being active. The increase in METs (671.18 to 767.95) shows that the intensity of activity also improved. Both results are statistically significant, proving that the exercise part of the intervention was effective. The findings suggest that combining healthy diet and regular exercise leads to better fitness outcomes. Improvement in diet helped in better nutrition, while increased physical activity improved endurance and energy levels. The results support the idea that lifestyle modification is important for student health. However, the lack of significant change in unhealthy food items shows that behaviour change takes time, and longer interventions may be needed. Overall, the study proves that a balanced approach of diet and exercise is effective in improving activity levels and dietary habits. The results of the study clearly show that the healthy diet and exercise intervention had a positive effect on students.

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