

A study to assess the effectiveness of self-instructional module on knowledge regarding effect of lifestyle on cardio pulmonary system among adults working in selected institute, Mangalore

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Abstract

Sedentary lifestyles, marked by prolonged sitting and low physical activity, are linked to various health issues such as coronary artery diseases, hypertension, obesity, and diabetes. This study aims to evaluate the effectiveness of a self-education module on the impact of lifestyle on the cardiopulmonary system among adults workers, highlighting the need for better health education and lifestyle changes.

Objectives of the study: To determine the level of knowledge regarding effect of life style on cardio pulmonary system. To evaluate the effectiveness of self instructional module on level of knowledge regarding effect of life style on cardio pulmonary system.

Methodology: The study aimed to assess the effectiveness of SIM in enhancing knowledge about lifestyle effects on cardiopulmonary system among adult workers. A one-group pre-test – post-test design was used, with 60 adults from a selected global institution in Mangalore selected. Data was collected using a structured knowledge questionnaire and analyzed using descriptive and inferential statistics.

Result: The study found that 98.3% of adult workers had moderate knowledge about lifestyle's impact on the cardiopulmonary system, while 46.7% had adequate knowledge post-test. The self-instruction module significantly improved knowledge scores, and no association was found between pre-test knowledge scores and demographic variables.

Conclusion: The study suggests that introducing lifestyle effects on cardiopulmonary system among adult workers can improve their knowledge and reduce occupational stress. The self-instructional module was found to be an effective strategy, providing information and enhancing knowledge about lifestyle modifications, without any association with pre-test knowledge scores or demographic variables.

Keywords: Effectiveness; Lifestyle Modification; Self Instructional Module; Cardio Pulmonary System; Adult Workers.

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1. Introduction

Lifestyle refers to the way individuals, families, and societies live, coping with their physical, psychological, social, and economic environment.¹ It is expressed in work and leisure behaviors, attitudes, interests, opinions, values, and income allocation.² A sedentary lifestyle is characterized by a lack of physical activity, often due to insufficient time or energy. This lifestyle is prevalent and can lead to muscle stiffness and slow blood circulation, affecting the overall health of the body.³ Physical inactivity, tobacco use, poor diet, and poor nutrition are leading to diseases like cardiovascular, diabetes, and pulmonary diseases, with cancer being the leading cause of death in developing countries.⁴ Lifestyle modifications like nutritious eating, daily physical exercise, weight loss, and smoking cessation can mitigate symptoms of cardiovascular disease and improve overall health. Exercise improves cellular metabolism,⁵ oxygen utilization, and reduces heart demand. Healthy choices can slow the aging process and prevent chronic diseases, making daily physical activity a crucial factor in maintaining cardiovascular health.⁶ A healthy lifestyle includes diet, exercise, stress management, adequate sleep, responsible drinking, and responsible drinking. It improves quality and length of life, and can be modified by individual decision and adequate knowledge. Increased knowledge helps control diseases and prevent complications.⁷

1.1. Operational definitions

- **Assess:** Assess refers to determine the knowledge regarding effect of lifestyle on cardiopulmonary system among adults working in selected institute.
- **Effectiveness:** Effectiveness refers to the extent to which Self-instructional module will achieve the desired result in enhancing the level of knowledge regarding the effect of lifestyle on cardiopulmonary system¹⁵.
- **Self-instructional module:** Self-instructional module refers to the self-contained written material prepared by the researcher to enhance the knowledge among adult workers about the effect of lifestyle on cardiopulmonary system, which includes the meaning of lifestyle, effect of poor lifestyle on cardiopulmonary system, and recommendations for healthy lifestyle.
- **Knowledge:** Knowledge refers to correct responses given by the adults working in the selected institute regarding effect of lifestyle on cardiopulmonary system as measured by structured knowledge questionnaire and interpreted in terms of levels such as adequate, moderately adequate and inadequate.
- **Lifestyle:** Lifestyle refers to the way of life a person leads which includes the living conditions, food habits, rest and sleep, habit of doing exercise, play activities, and use of leisure time.
- **Cardiopulmonary system:** Cardiopulmonary system refers to the system concerned with both the heart and the lungs.
- **Adults:** Adults refer to middle-aged adults in between 25 and 60 years who are employed in a particular institution.
- **Institute:** Institute refers to business process outsourcing (BPO) organization selected for the research at Mangalore.

1.2. Hypotheses

The following hypotheses are tested at 0.05 level of significance:

H₁: There will be a significant difference between pre and post-test level of knowledge scores regarding effect of lifestyle on cardiopulmonary system among adults working in selected institute.

H₂: There will be a significant association between the pre-test levels of knowledge regarding effect of life style on cardiopulmonary system among adults working in selected institute with their selected demographic variables.

2. Research methodology

2.1. Research approach

Research approach indicates the procedure for conducting the study. Evaluative approach was used in the study. Evaluative approach was used to evaluate the effectiveness of SIM on knowledge regarding effect of lifestyle on cardiopulmonary system among adult working in selected institute at Mangalore.

Research design: Pre experimental one group pre-test post-test design is employed in this study.

Setting of the study: The setting of the study for seeing the effectiveness of SIM on knowledge regarding effect of lifestyle on cardiopulmonary system was selected emphasis and institute of technical training centre at Mangalore. Formal permission was obtained from the concerned authorities for conducting the study.

Population: The term population refers to the aggregate or totality of all the objects, subjects or members that conform to a set of specifications.⁴⁶

In the present study the population comprised of adult workers in selected Emphasis and Institute of technical training centre, Mangalore for assessing effectiveness of SIM on knowledge regarding effect of lifestyle on cardiopulmonary system.

Sample and sampling technique: Sample refers to a sub set of a population selected for observation and participates in a research study. In the present study the sample consisted of 60 adults working in selected institution who met the inclusion criteria for assessing effectiveness of SIM on knowledge regarding effect of lifestyle on cardiopulmonary system. Sampling is the process of selecting a portion of the population to represent the entire population. In this study non-probability convenient sampling technique was adopted to select the adult workers for assessing the effectiveness of SIM on knowledge regarding effect of lifestyle on cardiopulmonary system. Considering the possibility of adult workers during duty hours, meetings and leave, the number of adult workers was chosen from one institution is 60 by non probability convenient sampling procedure.

3. Result

3.1. Organization of findings

The data is analysed and presented under the following headings:

- **Section I:** Frequency and percentage distribution of demographic characteristics among adult workers.
- **Section II:** Pre-test level of knowledge scores regarding effect to life style on cardiopulmonary system among adult workers.
- **Section III:** Effectiveness of self-instructional module on knowledge regarding effect of lifestyle of cardiopulmonary system.
- **Section IV:** Association of pre-test knowledge level among adult workers with selected demographic variables.

3.1.1. Section I: Demographic characteristics

This section describes the subjects' characteristics in terms of frequency and percentage and is depicted in Table 1.

Table 1 Frequency and percentage distribution of sample according to demographic variable N=60

Sl. No. Variables	Frequency	Percentage
1. Age(in years)		
25-31	28	46.7
32-38	28	46.7
39-45	3	5.0
46-52	1	1.7
53-59	-	-
Above 60 years	-	-
2. Gender		
Male	38	63.3
Female	22	36.7
3. Religion		

Hindu	28	46.7
Christians	25	41.7
Muslims	7	11.7
Others	-	-
4. Marital status		
Single	-	-
Married	59	98.3
Widow/Widower	-	-
Divorced/Separated	1	1.7
5. Educational status PUC		
Diploma/Degree	32	53.3
Post graduation	27	45.0
Any other	-	-

3.1.2. Section II: Pre-test level of knowledge scores regarding effect to life style on cardiopulmonary system among adult workers.

This section deals with the analysis and interpretation of data to assess the pre- test knowledge score of adult workers on knowledge regarding lifestyle of cardiopulmonary system.

Table 2 Frequency and percentage distribution of pre-test level of knowledge score among adult workers

			N=60
Sl. No.	Level of knowledge	Frequency	Percentage
1.	Moderately adequate	59	98.3
2.	Adequate	1	1.7
3.	Inadequate	-	-

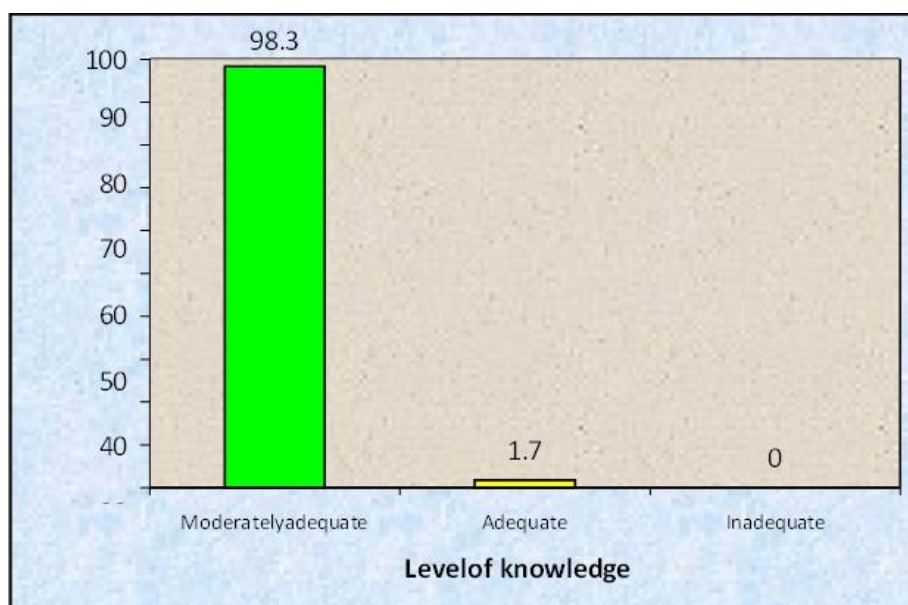


Figure 1 Frequency and percentage distribution of pre-test level of knowledge score among adult workers

Table 3 Range, mean, median and standard deviation of pre-test knowledge scores among adult workers N=60

Knowledge	Range	Mean	Median	SD	Mean%
Pre-test	12-21	17.07	17	2.18	56.89

Table 3 represents that in the pre-test knowledge score the mean was 17.07 with the range 8-19, standard deviation 2.18 and the mean percentage score was 56.89%.

Table 4 Area-wise pre-test knowledge regarding effect of life style on cardiopulmonary system score among adult workers N=60

Area	Max Score	Mean	SD	Mean%
Structure and function of cardiopulmonary system	3.0	1.78	0.67	59.44
Effect of poor lifestyle on cardiopulmonary system	15.0	8.45	1.60	56.33
Lifestyle modification strategies	12.0	6.83	1.46	56.94

The data presented in the Table 4 shows the mean, standard deviation and mean percentage of pre-test knowledge score of the samples on various areas of cardiopulmonary system. The pre-test knowledge score mean percentage is higher (56.94%) in the area about lifestyle modification strategies with mean 6.83 and SD

1.46 where as mean percentage score is lesser (1.78%) in the areas about structure and function of cardiopulmonary system with mean percentage of 59.44

3.1.3. Section III: Effectiveness of self-instructional module on knowledge regarding effect of lifestyle on cardiopulmonary system

This section deals with the analysis and interpretation of the data collected to evaluate the effectiveness of self-instruction module on knowledge regarding lifestyle on cardiopulmonary system in terms of knowledge gained. A structured knowledge questionnaire was used to collect the data. The data is analysed using descriptive statistics such as mean, median, standard deviation and inferential statistics such as 't' test.

Table 5 Frequency and percentage distribution of pre- and post-test level of knowledge score among adult workers N=60

Level of knowledge	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Adequate	1	1.7	46	76.7
Moderately adequate	59	98.3	14	23.3

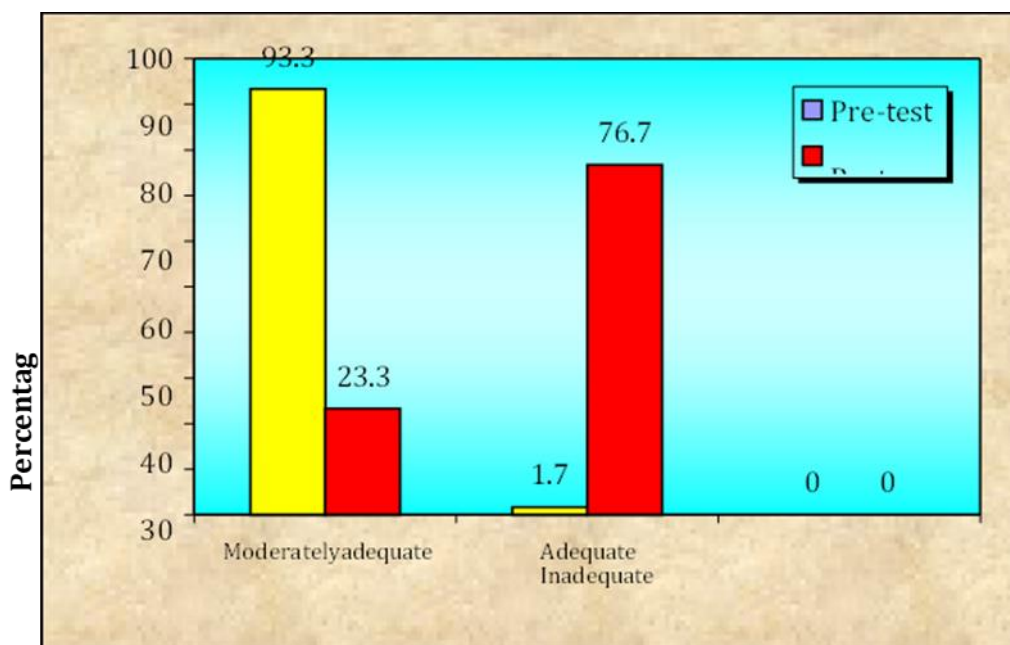


Figure 2 Cone diagram showing the distribution of adult workers according to the grade in level of knowledge score

The data presented in Table 5 and Figure 1 depicts that in the pre-test majority 59 (98.3%) of the samples had moderately adequate knowledge and remaining 1 (1.7%) had adequate knowledge, whereas, in the post-test it was observed that majority 46 (76.7%) of the adult workers had adequate knowledge, and only 14 (23.3%) had moderately adequate knowledge regarding lifestyle on cardiopulmonary system. This indicating a considerable gain in knowledge scores after administering self-instruction module.

To find the significance of mean difference between pre-test and post-test the following null hypothesis is stated:

H₀₁: There will be no significant difference between the pre and post-test level of knowledge scores regarding lifestyle on cardiopulmonary system among adult workers at 0.05 level of significance.

Table 6 Range, mean, median, standard deviation and ‘t’ value of pre-test and post-test knowledge scores of adult workers N=60

Period of observation	Range	Median	SD	Mean%	‘t’value
Pre-test	12-21	17.50	2.18	56.89	15.3*
Post-test	15-28	22.00	2.89	74.56	

* Significant p>0.05 Data in Table 6 represents higher mean(22.37)in the post-test knowledge

score with range 29-35, standard deviation 2.89, mean percentage score (74.56%). In the pre-test knowledge score the mean was (17.07) with the range 9-19, standard deviation 2.18 and the mean percentage score (56.89%).

Table value of t at 0.05 level of significance with 59, df was 1.67. The calculated ‘t’ value is 15.3, which is greater than the table value at 0.05 level of significance. Hence null hypothesis is rejected and the research hypothesis is accepted. Thus it is inferred that there is significant deference between mean pre-test and mean post-test knowledge score of adult workers which indicate the effectiveness of self-instruction module in enhancing the knowledge on lifestyle on cardiopulmonary system.

Table 7 Area-wise pre-test and post-test knowledge scores among adult workers N=60

Mean %			Knowledge score		Mean percentage
			Actual gain	Possible gain	Modified gain
Area	Pre-test	Post-test	(A)	(B)	(A/B×100)
Structure and function of cardiopulmonary system	1.78	2.20	0.42	3	14.0
Effect of poor life style on cardiopulmonary system	8.45	11.07	2.02	15	13.5
Lifestyle modification strategies	6.83	9.10	2.27	12	18.9

The data presented in Table 7 shows the pre-test knowledge Score of the adult workers of lifestyle on cardiopulmonary system. The pre-test knowledge score was higher (72.5%) in the area about heart and its function and lesser (26.43%) in the areas about effect of lifestyle on cardiopulmonary system, Where in post-test the score is higher (97.5%) in the area about heart and its function and the least score was (88.75%) in the area about types of cardiopulmonary system.

Table 8 Area-wise paired 't' test showing the significant difference between pre- test and post-test knowledge scores of effect of lifestyle on cardiopulmonary system among adult workers N=60

Max. Area score	Mean	Pre-test		Post-test		Mean %	't' value	
		SD	Mean %	Mean	SD			
Structure and function of cardiopulmonary system	6	1.78	0.67	59.44	2.20	0.84	73.33	2.83*
Effect of poor lifestyle on cardiopulmonary system	8	8.45	1.60	56.33	11.07	1.82	73.88	12.54*
Lifestyle modification strategies	12	6.83	1.46	56.94	9.10	1.57	75.83	11.02*

Strategies; *Significant(P=<0.05)

Area 1: Structure and function of cardiopulmonary system Area2: Effect of poor life style on cardiopulmonary system Area 3: Lifestyle modification strategies

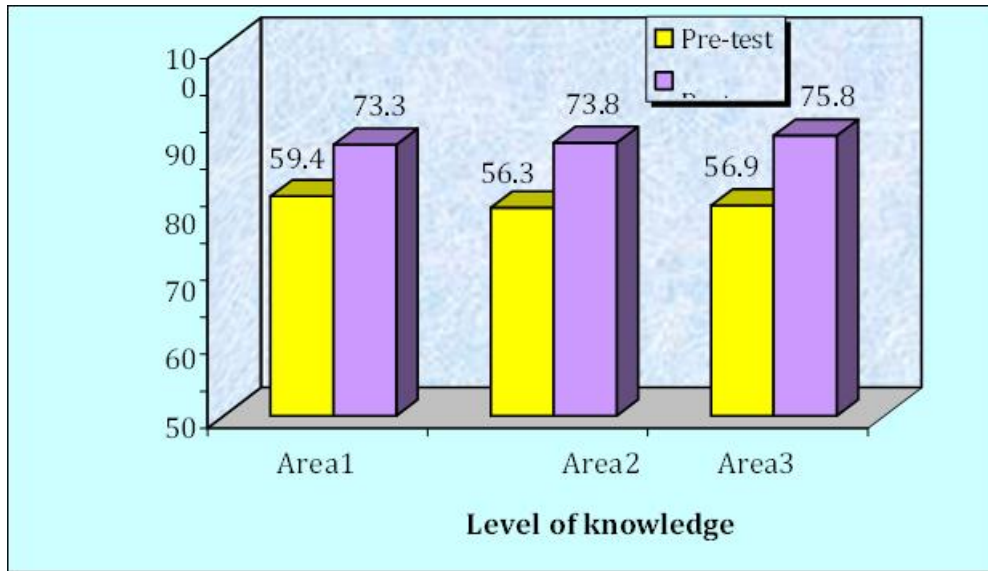


Figure 3 Bar diagram showing distribution of mean percentage score of pre- test and post-test scores on lifestyle on cardiopulmonary system among adult workers

The data in Table 8 and Figure 10 shows that there is significant difference in the pre-test and post-test score of adult workers and by the calculated 't' value (1.67) respective areas.

3.1.4. Section V: Association the of pre-test knowledge level of adult workers regarding lifestyle on cardiopulmonary with selected demographic variables

This section deals with the association of pre-test knowledge score of adult workers with selected demographic variables. To find the association of the knowledge score with demographic variables, the following null hypothesis was formulated:

H₀₂: There will be no significant association of pre-test level of knowledge among Adult workers with their selected demographic variables. Chi-square was computed to test the hypothesis. The data is presented in Table 10.

Table 9 Chi-square value of pre-test knowledge scores and selected demographic variables N=60

Sl.No.	Variable	Knowle <Mean	dgescore >Mean	χ^2 value	Inference
1.	Age				
	Below25years	12	16		
				1.071	NS
	Above45years	18	14		
2.	Gender				
	Male	19	19	.000	NS
	Female	11	11		
3.	Religion				
	Hindu	18	10		
				4.286	NS
4	Muslim & Christian	12	20		
5	Marital status				

	Married	29	30		
	Divorced	1	0	.500	NS
6	Educational Status				
	PUC/ Postgraduate	11	17		
	Dipoma/ Degree	19	13	2.411	NS
7	Do you have the habit of consuming tobacco				
	Yes				
	No				
	If yes what type of tobacco				
	Chewable/Snuff	11	15		
	Smok able	19	15	1.086	NS

Table value $\chi^2=3.84$, $p<0.05$; NS=No significance The data presented in Table 9 shows the association of knowledge score of

Adult workers with their demographic characteristics and it was found out that here is No association between the pre-test knowledge score and the selected demographic variables. Therefore the null hypothesis (H_{01}) is accepted.

4. Discussion

Discussion of major findings of the study

4.1. Section I: Frequency and percentage distribution of demographic characteristics among adult workers

Age distribution of the adult workers shows that majority 28 (46.7%) of the adult workers were equally distributed in the age group of 25-31 years and 32-38 years and remaining 3 (5%) were in the age group of 39-45 years and remaining 1 (1.7%) were in the age group of 46-52 years. Majority 38 (63.3%) of the adults were Male and female were 22 (36.7%). Highest percentage 28 (46.7%) of adult workers

were Hindus, whereas 25 (41.7%) were Muslim and remaining 7 (11.7%) were Christians. Majority 32 (53.3%) of the adult workers had diploma and degree whereas 27 (45%) of adult workers had post graduation and about 4 (6.7%) had studied up to PUC.

The finding of the study is consistent with a study conducted in Surat to estimate the effect of lifestyle risk factors on prevalence of hypertension among bank employees. The result of the study showed that majority 30 (50%) of the bank employees were equally distributed in the in the age group of 25-31 years and 32-38 years. Majority 28 (46.6%) of the adults were male and females were 32 (53.3%). Highest percentage 26 (43.3%) of adult workers were Hindus, whereas 25 (41.6%) were Muslim and remaining 9 (15%) were Christians.

4.2. Section II: Pre-test score of lifestyle of cardiopulmonary system among adult workers

Pre-test level shows that the adult workers about 59 (93.3%) had moderately adequate level of knowledge score and remaining 1 (1.7%) had adequate level of knowledge score. The mean pre-test knowledge score are 17.07 with the range 12-21, standard deviation 17 and the mean percentage score 56.89%. This result shows that the adults are not having inadequate level of knowledge regarding effect of lifestyle on cardiopulmonary system. The finding is consistent with a study conducted in USA to determine knowledge regarding effect of lifestyle on cardiovascular disease among adult workers. The result shows that among the adult workers about 55 (93.3%) had moderately adequate level of knowledge and remaining 5 (6.7%) had adequate level of knowledge. Thus it is concluded that the adults workers were having moderately adequate level of knowledge regarding health appraisal and found of self-instruction module was an effective strategy for gaining knowledge.

4.3. Section III: Effectiveness of self-instructional module on knowledge regarding Lifestyle on cardiopulmonary system

In the post-test it was observed that majority 46 (76.7%) of the adult workers had adequate knowledge and only a few 14 (23.3%) had moderately adequate knowledge where as pre-test majority 59 (98.3%) of the adult workers had

moderately knowledge and only 1 (1.7%) had moderately adequate knowledge and none of them were in adequate level regarding effect of lifestyle on cardiopulmonary system. This indicates a considerable gain in knowledge scores after administering self-instruction module on knowledge regarding lifestyle on cardiopulmonary system.

The mean post-test knowledge score (22.37) is higher than the mean pre-test knowledge score (17.07).

It is also found that the pre-test knowledge score is lesser (13.89%) in the area about anatomy and physiology of cardiopulmonary system and greater (17.44%) in the areas of effect of lifestyle on cardiopulmonary system, whereas in post-test score is lesser (73.33 %) in the area about anatomy and physiology of cardiopulmonary system and greater (75.83%) in the areas of effect of lifestyle on cardiopulmonary system.

The difference between the mean post-test and the mean pre-test knowledge score was found to be statistically significant ($t_{59}=15.13$) at 0.05 level of significance, which shows that the self-instruction module on knowledge regarding lifestyle on cardiopulmonary system was effective.

The finding of the study is consistent with prospective study conducted over 7 months period in Japan to assess the knowledge of lifestyle on cardiac and pulmonary diseases among adult workers and it showed that before education 92 (61.33%) of the study population had below average knowledge, 38 (25.33%) had average knowledge, and 20 had above average knowledge. After distributing information booklet only about 12 (8%) study population were in the below average group ($t_{59}=11.821$), which shows that the administration of self-instructional module was effective among the adult workers⁴⁴.

The finding is in congruence with a quasi-experimental study which was conducted in Netherlands, to evaluate the effectiveness of self-instructional module on knowledge regarding effect of lifestyle on cardiopulmonary system among adults working in selected institute. The study was conducted in one selected IT company with a convenience sample of 60 adult workers found that there was a significant difference between the pre and post test at 0.05 level of significance. This shows the effectiveness of above mentioned studies and the findings of the present study clearly shows the effectiveness of self-instructional module on knowledge regarding effect lifestyle on cardiopulmonary system.⁴⁶

4.4. Section IV: Association the of pre-test knowledge score of adult workers regarding lifestyle on cardiopulmonary with selected demographic variables

The finding of the study revealed that there is no significant association with pre-test level of knowledge scores of adult workers regarding lifestyle on cardiopulmonary and selected demographic variables at 0.05 level of significance. The conclusion which can be drawn from the study is that there is no association with the pre-test knowledge scores and selected demographic variables.

5. Conclusion

Adult workers comprise a large and growing segment of the workforce in many countries. In fact, adult workers is an occupation that is often characterized by a high degree of stress, absenteeism, and burnout. There are many sources of adult worker stress which may raise the normal blood pressure. Stress which includes administrative and curriculum concerns, career advancement, student motivation, work overload due to shortage of adult workers, intensive verbal communication, lifestyle modification and prolonged sitting⁴⁸. So the knowledge of effect of lifestyle on cardiopulmonary system and they can practice in their daily living.

Following are the significant findings

- Most of the samples 59 (98.3%) had moderately adequate knowledge score in the pre-test.
- The mean post-test knowledge score 23.3 is significantly higher than the mean pre-test knowledge score 17.07 after the administration of self-instructional module.
- About 59 (93.3%) of the adult workers had moderately adequate knowledge in the pretest and 1(1.7%) had adequate knowledge regarding cardiopulmonary system .
- In the post-test majority 46 (76.7%) of the adult workers attained adequate level of knowledge regarding lifestyle modifications.
- The mean post-test knowledge score (23.33) is significantly higher than the mean pre-test knowledge score(17.07) among adult workers after administering self-instruction module on knowledge regarding cardiopulmonary system.

- It is also found that there is a significant difference between pre-test and post- test knowledge score with paired t test ($t=15.3$).
- It reveals that the gain in knowledge scores maximum (97.5%) in the area about heart and its function and whereas minimum (88.75%) in the area of types of lifestyles on cardiopulmonary system during the post-test.
- So it shows that self-instruction module is one of the effective methods of knowledge for lifestyle on cardiopulmonary system and there is no association with the pre-test knowledge scores and selected demographic variables.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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