

## Effectiveness of Structured Exercise Programme on Vo2 Max, Body Fat and General Well Being among College Students

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**Abstract:** Physical activity and physical fitness is important to lead a healthy life. Exercises help to maintain ideal body weight, have hormone balance, promotes blood circulation, keeps active, enhance sleep and better brain function. It also creates a sense of wellbeing, produce greater energy and reduce the risk of developing many diseases. Evaluative approach was adopted to assess Effectiveness of the Structured Exercise Programme on VO<sub>2</sub>max, Body Fat and General Well Being of 37 female college students in College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry. Results shows that, 33 (89.2%) students were in the age group of 17 years and 4 (10.8%) were in the age group of 18 years. over all general wellbeing level was increased during posttest. Statistically significant changes observed in body fat including triceps, biceps, abdominal and calf muscle circumference, heart rate, VO<sub>2</sub> Max between pretest and posttest. So the study concluded that, Structured Exercise Programme has positive effect on VO<sub>2</sub> Max, Body Fat and General Well Being Among College Students.

**Key Words:** *Vo2 Max, Body Fat, General Well Being and Structured Exercise Programme*

### I. Introduction

Physical fitness is important for all human beings, irrespective of their age. Regular physical activity promotes growth and development and has multiple benefits for physical, mental, and psychosocial health that contribute to learning. It also creates a sense of wellbeing, produce greater energy and reduce the risk of developing many diseases.

### II. Need for the study

Sedentary behaviour of present generation contributes to health risks. Doing physical activity everyday contributes to optimum health and quality of life. Life styles can be changed to improve health and fitness through daily exercises. There is a need to develop structured exercise programme for nursing students. So, the researcher wants to evaluate the effects of structured exercise programme on VO<sub>2</sub>max, body fat and general wellbeing among nursing students.

### III. Objectives

1. To assess Effectiveness of the Structured Exercise Programme on VO<sub>2</sub>max, Body Fat and General Well Being of female college students.

### IV. Research Methodology

**Approach:** Evaluative approach is used for this study

**Design:** Quasi experimental design (One group pre and posttest)

**Setting:** College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry

**Population:**Female students attending Colleges.

**Samples:** B.Sc Nursing I year Female students

**Sampling technique:** Purposive sampling

**Sample size:** 37 in B.Sc Nursing I year Female students

**Sampling Criteria:**

**Inclusion criteria:**

1. Female students of B.Sc Nursing I year
2. Female students willing to participate in the study

**Exclusion criteria:**

Female students

- undergone training on structured exercise programme
- With chronic disease problem (Asthma, Spinal cord – Back pain, Cardiac problem)
- Involved in regular sports activities or National Cadet corps

**Instruments & Tool**

Tool consist of three section

**Section- A:**

- Demographic data includes age and athlete
- Anthropometric measurement including Height & Weight and Heart rate.

**Section- B:**

- Measurement of body fat from four different skin sites and take average of skin fold thickness.
- Measurement of Vo2 Max by Cooper run and walk test

**Section- C:** Self-administered closed ended questionnaire on general well-being that focuses on one's subjective feelings of physical, psychological, and social well-being.

**V. Ethical Consideration**

Formal permission obtained from Institutional Review Board and Head of the department by the Researchers. The informed consent was obtained from participant after explaining the purpose of the study. The participants had a freedom to leave the study at her will without assigning any reason. Collected data used only for research purpose without revealing the identity of the study participants.

**VI. Data collection methods**

The data was collected over a period of three months at Pondicherry Institute of Medical Sciences Pondicherry. The investigator obtained written permission from each participant after explaining the nature and the purpose of the study. Basic information about the participants was collected. Participants were assessed by Cooper 9 minutes' walk and run test for vo2 max, skin fold thickness to measure body fat and general wellbeing before the intervention. Structured exercise programme given for one hour for 5 days in a week from Monday to Friday in the evening for three months. At the end of the three months posttest was conducted to test the effectiveness of structured exercise program.

**VII. Scope of the study**

- The students will be able to know that the structured exercise programme can bring a change in vo2max, body fat and general wellbeing.
- This study would help us to motivate the upcoming batches of nursing students to participate in such exercise programmes.

## VIII. Results

### Section:A

**Table 1: Distribution of students according to Age**

N= 37

Age in years	Frequency	Percentage (%)
17	33	89.2
18	4	10.8

Table 1 shows that 33 (89.2%) students were in the age group of 17 years and 4 (10.8%) were in the age group of 18 years.

**Table 2: Distribution of students according to Athlete**

N= 37

Athlete	Frequency	Percentage (%)
No	34	91.9
Yes	3	8.1

Table 2 shows that 34 (91.9%) students were not an Athlete and only 3 (8.1%) were an Athlete

**Table 3: Mean, SD of Anthropometric Measurement and Heart rate before and after structured exercise program**

N=37

Anthropometric Measurement & Heart rate	Pretest		Post test	
	Mean	SD	Mean	SD
Height (cm)	157.62	6.647	157.89	6.883
Weight (kg)	52.32	15.481	51.68	14.166
Heart Rate (bpm)	79.57	6.702	77.24	6.025

Table 3 shows, Mean pretest Height was (157.62± 6.647cm) and post test (157.89± 6.883cm). Mean pre test Body Weight (52.32± 15.481kg) and post test (51.68± 14.166kg). Mean pre test Heart rate (79.57± 6.702bpm) and post test (77.24± 6.025bpm).

**Section B****Table 4: Mean, SD of bodyfat before and after structured exercise program**

N=37

Body Fat	Pre test		Post test	
	Mean	SD	Mean	SD
Triceps(mm)	8.14	2.679	6.89	2.797
Biceps (mm)	4.19	1.543	11.38	3.157
Abdomen (mm)	8.49	3.437	9.86	3.155
Calf (mm)	10.76	3.209	12.54	3.671

Table 4 shows, Mean pretest Triceps was (8.14± 2.679mm) and post test (6.89± 2.797mm). Mean pre test Biceps (4.19± 1.543mm) and post test (11.38± 3.157mm). Mean pre test Abdomen (8.49± 3.437mm) and post test (9.86± 3.155mm). Mean pre test calf (10.76± 3.209mm) and post test (12.54± 3.671mm).

**Section C- General wellbeing****Table 6: Distribution of students according to general wellbeing**

N=37

General wellbeing	Scoring	Pretest		Post test	
		F	Percentage (%)	F	Percentage(%)
My health	Poor	1	2.7	0	0
	Average	15	40.5	8	21.6
	Good	19	51.4	26	70.3
	Excellent	2	5.4	3	8.1
Health status	Worse now than one month ago	3	8.1	5	13.5
	About the same	27	73.0	11	29.7
	Better now than one month ago	7	18.9	21	56.8
Body pain	Severe	1	2.7	4	10.8
	Moderate	5	13.5	10	27.0
	Mild	16	43.2	18	48.6
	Nil	15	40.5	5	13.5
Paininterfere	Quite a bit/Extremely	2	5.4	2	5.4
	A little bit/moderately	19	51.4	23	62.2

	Not at all	16	43.2	12	32.4
Waking up fresh	Never	0	0	1	2.7
	Few of the days	11	29.7	14	37.8
	Most of the days	14	37.8	16	43.2
	Almost all the days	12	32.4	6	16.2
Interaction with relatives	Poor	2	5.4	1	2.7
	Average	7	18.9	1	2.7
	Good	14	37.8	22	59.5
	Excellent	14	37.8	13	35.1
Interaction with friends	Poor	1	2.7	0	0
	Average	1	2.7	3	8.1
	Good	20	54.1	16	43.2
	Excellent	15	40.5	18	48.6
Overcoming stress	Chat with friends	17	45.9	22	59.5
	Eat a lot	4	10.8	3	8.1
	Praying	12	32.4	8	21.6
	Meditation	4	10.8	4	10.8

Table 6, shows that over all general wellbeing level increased during posttest after structured exercise programme.

**Table 7: Rating Scale on General wellbeing**

**N=37**

Item	Rating	Pretest		Post test	
		F	Percentage (%)	F	Percentage (%)
Cool and relaxed	None of the time	1	2.7	2	5.4
	Little of the time	12	32.4	14	37.8
	Most of the time	21	56.8	17	45.9
	All the time	3	8.1	4	10.8
Low depressed or	None of the time	6	16.2	6	16.2
	Little of the time	25	67.6	25	67.6
	Most of the time	5	13.5	5	13.5
	All the time	1	2.7	1	2.7
Calm and peaceful	None of the time	1	2.7	1	2.7
	Little of the time	1	2.7	9	24.3
	Most of the time	13	35.1	16	43.2
	All the time	22	59.4	11	29.7
Tired	None of the time	1	2.7	6	16.2
	Little of the time	12	32.4	8	21.6
	Most of the time	24	64.9	22	59.5
	All the time	0	0	0	0
Full of energy	None of the time	1	2.7	2	5.4
	Little of the time	3	8.1	2	5.4
	Most of the time	11	29.7	15	40.5
	All the time	22	59.4	17	45.9

Anxious	None of the time	9	24.3	7	18.9
	Little of the time	22	59.5	23	62.2
	Most of the time	3	8.1	4	10.8
	All the time	3	8.1	2	5.4
Confident and happy	None of the time	1	2.7	1	2.7
	Little of the time	8	21.6	9	24.3
	Most of the time	19	51.4	15	40.5
	All the time	9	24.3	12	32.4
Good sleep	None of the time	1	2.7	3	8.1
	Little of the time	12	32.4	11	29.7
	Most of the time	12	32.4	13	35.2
	All the time	12	32.4	10	27.0
Stress pressure and	None of the time	8	21.6	11	29.7
	Little of the time	26	70.3	14	37.8
	Most of the time	3	8.1	9	24.3
	All the time	0	0	0	0
nervous	None of the time	6	16.2	7	19.0
	Little of the time	21	56.8	25	67.5
	Most of the time	6	16.2	5	13.5
	All the time	1	2.7	0	0
Over eat	None of the time	3	8.1	7	18.9
	Little of the time	19	51.4	20	54.1
	Most of the time	15	40.5	10	27.0
	All the time	0	0	0	0

Table 7, shows that no change observed in the low or depressed area. Other areas positive changes observed in posttest.

#### **Section D: Effectiveness of Structured Exercise Programme**

**Table 8: Paired 't' value of pre and posttest height**

**N=37**

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
<b>Pre height – Post Height</b>	-0.270	1.217	.200	-.676	.135	-1.351	36	.185

Table 8: shows that statistically no significant difference found in pre and posttest height of female college students. It reveals that Structured Exercise Programme has no effect on height of the students.

**Table 9: Paired sample correlation of pre and posttest height**

N=37

	Correlation -r	Sig.
Pre_Height&Post_Height	.984	.000

Table 9: shows that statistically highly significant correlation found between pre and posttest height female college students.

**Table 10: Effectiveness of Structured Exercise Programme on Weight and heart rate Vo2 Max, Body Fat among Students by Wilcoxon Signed Ranks Test**

N=37

Weight Heart Rate Body Fat & Vo2 Max	Negative Rank			Positive Rank			Test statistics		
	n	Mean Ranks	Sum of Ranks	n	Mean Ranks	Sum of Ranks	Ties	Z	p
Post_Weight - Pre_Weight	17 <sup>a</sup>	11.41	194.00	7 <sup>b</sup>	15.14	106.00	13 <sup>c</sup>	-1.260 <sup>b</sup>	.208
Post_HR - Pre_HR	21 <sup>d</sup>	18.69	392.50	10 <sup>e</sup>	10.35	103.50	6	-2.847 <sup>b</sup>	.004
Post_Triceps (mm) - Pre_Triceps (mm)	23 <sup>g</sup>	16.65	383.00	7 <sup>h</sup>	11.71	82.00	7 <sup>i</sup>	-3.128 <sup>b</sup>	.002
Post_Biceps (mm) - Pre_Biceps (mm)	0 <sup>j</sup>	.00	.00	37 <sup>k</sup>	19.00	703.00	0 <sup>l</sup>	-5.310 <sup>c</sup>	.000
Post_Abdominal (mm) - Pre_Abdominal (mm)	11 <sup>m</sup>	9.36	103.00	20 <sup>n</sup>	19.65	393.00	6 <sup>o</sup>	-2.860 <sup>c</sup>	.004
Post_Calf(mm) - Pre_Calf(mm)	8 <sup>p</sup>	16.94	135.50	26 <sup>q</sup>	17.67	459.50	3 <sup>r</sup>	-2.783 <sup>c</sup>	.005
Post_Total - Pre_Total	22 <sup>s</sup>	12.86	283.00	3 <sup>t</sup>	14.00	42.00	12 <sup>u</sup>	-3.373 <sup>b</sup>	.001
Post_Rounds - Pre_Rounds	26 <sup>v</sup>	17.38	452.00	7 <sup>w</sup>	15.57	109.00	4 <sup>x</sup>	-3.069 <sup>b</sup>	.002

b. Based on positive ranks.

c. Based on negative ranks.



Table 9 shows that, statistically significant change observed in body fat including triceps, biceps, abdominal and calf muscle circumference, heart rate, Vo2 Max between pretest and posttest.

**Table 10: Association of pre and post health status by Chi-Square Tests**

N= 37

	Value	df	Asymp. Sig. (2-sided)
McNemar-Bowker Test	15.000	3	.002
N of Valid Cases	36		

Table 10 shows that statistically significance association found between pre and post health status.

### IX. Conclusion

Results shows statistically significant changes in Vo2 Max, body fat and general wellbeing of female college students between pretest and posttest. So the study findings support the hypothesis that structure exercise programme has positive impact on Vo2 Max, body fat and general wellbeing of female college students.

### X. Recommendations

- A similar study could be replicated on a larger population to generalize the findings.
- Studies can be done having control group to compare the effect of intervention.
- Structured exercise programme can be implemented as part of their daily routine to promote physical activity and prevent lifestyle diseases.

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