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EFFECT OF TRAINING FORMS ON FITNESS LEVEL OF MEDICAL STUDENTS

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Abstract – Introduction: *Cardiovascular and metabolic diseases are leading public health concerns, and their prevention lies in lifestyle modification. Physical activity remains a major contributing factor. Studies have shown that medical students, owing to a higher curricular load, have insufficient physical activity. Physical education has been integrated in medical education, but little is known about its impact on students' Health-Related Physical Fitness (HRPF).* ***Aim:*** *To assess the effect of training forms on HRPF on first-year MBBS students.* ***Objectives:*** *To assess baseline HRPF for first-year MBBS students, and to find out changes after a 3-month physical activity intervention.* ***Materials and Methods:*** *Sixty first-year MBBS students (F=40, M=20) at Government Medical College, Kottayam, underwent baseline assessment of five health-related fitness components (YMCA step test for cardiorespiratory fitness; standardized tests for muscular strength/endurance, flexibility, and BMI). Subsequently, 27 students participated in a 3-month taekwondo program (2 sessions/week for 48 hours total), while others formed a control group. Pre- and post-test data were analyzed and compared against normative benchmarks.* ***Results:*** *Baseline data indicated poor health-related physical fitness across both genders. Post-intervention, the experimental group showed significant improvements in HRPF.* ***Conclusion:*** *Incoming medical students possess poor physical fitness. Structured physical activity interventions, tailored to student preferences, can effectively enhance fitness. Sustainable improvement requires ongoing programmatic support, and further longitudinal studies are recommended to assess students as they progress in their studies.*

Keywords: Physical education, Taekwondo, Health-related physical fitness, Medical students

INTRODUCTION

The need for effective and practical prevention and treatment of cardiovascular and metabolic diseases is evident to physicians, who are often the primary source of health information for their patients. Management of obesity, CVD, and diabetes requires a balance of both medical intervention and lifestyle modification [(1)].

While physicians are trained in the medical management of these diseases, most find medical education lacking adequate training for teaching patients about lifestyle modifications. A study conducted at 128 allopathic medical schools in the US on the perception of deans and directors of medical education regarding their students' ability to perform six fundamental skills related to exercise prescription found that only 10% were confident that their students are competent in designing an exercise prescription. The authors suggested the need for more undergraduate medical training in physical activity and exercise prescription [(2)].

Background

In India, the curriculum of medical education was revamped, and from the year 2019, time slots were allotted for physical education, sports, and yoga in undergraduate medical programs.

Undergraduate medical students form a very important subset of young adults in any society since they are the forming elements of the future healthcare infrastructure. The stress associated with intense training in medical school and a lack of physical exercise puts the students at higher risk of cardiovascular diseases in later life. Too many studies and little time for physical activity have put a lot of medical school entrants in the sedentary category [(3)].

In this study, an effort will be made to find out the fitness level of incoming medical students. The physical education classes allotted to first-year MBBS students of Government Medical College, Kottayam, will be used to give them fitness activities, and the effect of these fitness activities on fitness will be studied.

MATERIALS AND METHODS

Data was collected from 60 (F=40, M=20) first-year MBBS students during physical education classes allotted to them. The whole group of students was administered a health-related fitness components test. Health-related fitness components include 5 components, and they are cardio-respiratory fitness (CRF), muscular strength, muscular endurance, flexibility, and body composition. Cardiorespiratory fitness was measured by the YMCA 3-minute step test. Standard test, as mentioned in fitness protocols and guidelines under the Fit India Mission, was administered to students for the remaining four items. The test includes a one-minute partial curl-up for muscular strength assessment, pushups (male) and modified pushups (female) for muscular endurance, the sit and reach test for flexibility assessment, and the BMI index for body composition. Scores of all five items are recorded. Pre-data regarding fitness assessment are hence collected.

After the pretest, students were asked to choose any one physical activity from Aerobics, Taekwondo, and Yoga. 6 students opted for Aerobics, 2 students opted for Yoga, and 52 students opted for Taekwondo. As the number of students in aerobics and yoga was negligible, these two training groups were eliminated from the study. Students were provided with two days (2 hours) of sessions per week. The training was thus held over three months. Students received a total of 16 hours a month and 48 hours over a 3-month duration. During the intervention program, a focused group discussion (FGD) was conducted among the experimental group to learn about the facilitation and barriers to the taekwondo program. After the completion of the intervention, a post-test was conducted on the experimental and control groups using the same fitness tests.

Test results were compared with the normative data of YMCA, Fit India Mission, and WHO.

Results

Here we present the statistical data and analysis of baseline data of HRPF, pre- and post-intervention of experimental and control groups.

Table -1

Baseline data of HRPF compared with normative data

CRF	**Gender**	**Excellent**	**Good**	**Above Average**	**Average**	**Below Average**	**Poor**	**Very poor**	**Total**
	Female	1	0	3	5	8	5	18	40
	Males	0	0	0	1	2	7	10	20
Muscular Endurance	**Gender**	**0-1 (work harder)**		**2 to 6 (must improve)**	**7 to 11 (can do better)**	**12 to 22 (good)**		**23 to 29 (very good)**	**Total**
	Female	0		8	22	10		0	40
	Gender	**<4 (work harder)**	**4-9 (must improve)**	**10 to 16 (can do better)**	**17 to 29 (good)**	**30 to 39 (very good)**	**39 to 47 (excellent)**	**>47 (super)**	**Total**
	Males	1	0	6	9	3	1	0	20
Muscular Strength	**Gender**	**<18 (work harder)**	**18-24 (must improve)**	**25 to 28 (can do better)**	**29 to 32 (good)**	**33 to 36 (very good)**	**37 to 43 (excellent)**	**>43 (super)**	**Total**
	Female	40	0	0	0	0	0	0	40
	Gender	**<25 (work harder)**	**25-30 (must improve)**	**31 to 34 (can do better)**	**35 to 38 (good)**	**39 to 43 (very good)**	**44 to 49 (excellent)**	**>49 (super)**	**Total**
	Male	20	0	0	0	0	0	0	20
Flexibility	**Gender**	**14 to 16 (well below average)**		**17-18 (below average)**	**19 to 20 (Average)**	**21 to 23 (Above average)**	**>24 (well above average)**		**Total**
	Females	36		2	2	0	0		40
	Gender	**11 to 13 (well below average)**		**14 to 16 (Below average)**	**17 to 18 (Average)**	**19 to 22 (Above average)**	**>22 (well above average)**		**Total**
	Males	13		4	1	2	0		20
Body Mass Index	**Gender**	**<18.5 (underweight)**		**18.5 to 25 (healthy weight)**		**25 to 30 (Overweight)**	**>30 (Obese)**		**Total**
	Females	8		27		5	0		40
	Males	5		9		6	0		20

Table – 2

Pre and Post test scores of health-related physical fitness components of the Experimental group.

	Group	N	Mean	Std. Deviation	Std. Error Mean	T	P value
CRF	Pre-test	27	123.67	17.87	3.441	5.979	.000
	Post-test	27	112.67	17.19	3.309		
Muscular strength (Curl ups)	Pre-test	27	12.07	2.05	.396	10.656	.000
	Post-test	27	15.78	2.30	.444		
Muscular Endurance (Push Ups)	Pre-test	27	15.63	9.23	1.777	11.436	.000
	Post-test	27	19.78	9.50	1.829		
Flexibility	Pre-test	27	12.29	3.24	1.585	16.310	.000
	Post-test	27	13.85	3.08	1.509		
BMI	Pre-test	27	21.30	3.90	.75223	8.603	.000
	Post-test	27	20.53	3.23	.62283		

Figure - 1

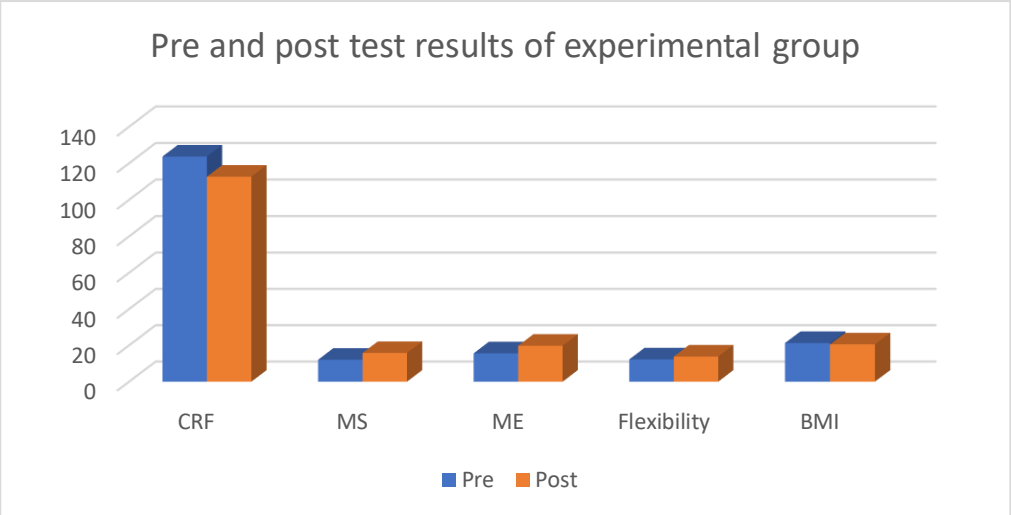
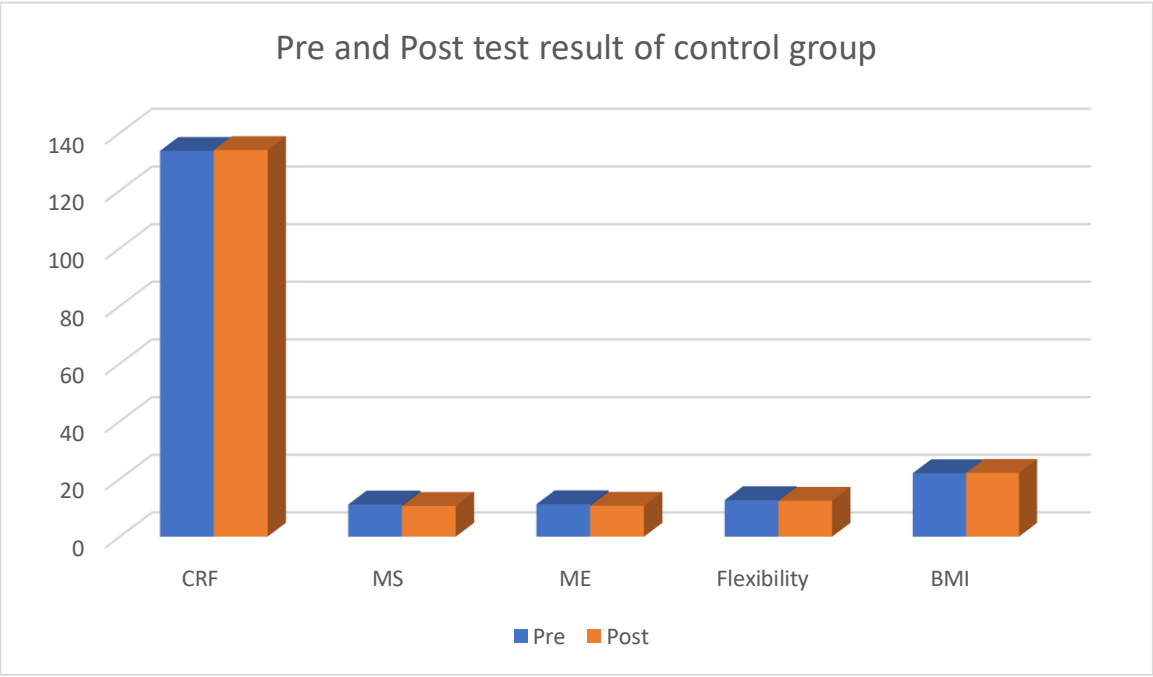


Table – 3

Pre and Post test scores of health-related physical fitness components of control group.

	Group	N	Mean	Std. Deviation	Std. Error Mean	T	P value
CRF	Pre-test	33	133.82	20.375	3.547	.579	.567
	Post-test	33	134.09	19.880	3.461		
Muscular strength (Curl ups)	Pre-test	33	11.18	1.828	.318	3.550	.001
	Post-test	33	10.67	1.514	.264		
Muscular Endurance (Push Ups)	Pre-test	33	11.27	7.260	1.264	2.204	.035
	Post-test	33	10.70	6.317	1.100		
Flexibility	Pre-test	33	12.65	3.74	1.656	2.781	.009
	Post-test	33	12.45	3.59	1.591		
BMI	Pre-test	33	22.02	5.53	1.541	1.750	.090
	Post-test	33	22.11	5.45	1.478		

Figure - 2



Discussion

As per WHO globally, more than 80% of the adolescent population is physically inactive. It is evidenced that physically inactive people are 20-30% times more likely at risk of death compared to active individuals. Currently, there are global efforts to decrease the prevalence of physical inactivity by 10% by the end of 2025 [(4)].

Our study results show that incoming medical students have poor health-related physical fitness scores. It was found that when 3 months of taekwondo training were provided to interested students, their scores on health-related physical fitness significantly improved. When we compared their post-test scores with the standardized scores, we found that they still fell well below the desired scores on HRPF. So, it is understood that three months of training is not sufficient for these students to attain desirable HRPF. They need to adhere to the training program for a longer time. This underlines the need for a comprehensive program in physical activity for medical students.

A study conducted across 197 countries from 2000 to 2022 by Tessa Strain et al. in 2024 shows a sharp rise in physical inactivity among Indian adults. In 2022 45.4 % of Indian adults were inactive up from 22.4% in 2000. The gender disparity is notable, with 52.6 % of women and 38.4% of men physically inactive. If this trend continues, inactivity levels could reach 55% by 2030. This could lead to serious health issues like cardiovascular diseases, type 2 diabetes, dementia, and certain cancers [(5)].

Our study has found that there are very few takers for yoga or aerobics training programs. However, taekwondo was chosen by the majority of the students. As the training program was not compulsory, students opted for taekwondo out of their interest. Physical activity can be done through various activities. Activities like yoga and aerobics, which are popular among adults, are not preferred by students when given a choice.

Kumar PSS et al conducted a study on medical students in AIIMS, New Delhi, and found that there are facilitating factors and barriers to physical activity among undergraduate medical students. The facilitating factors are the desire to reduce weight, six packs, disease in the family due to sedentary behaviors, participation in sports, peer support, childhood habits, and body image, whereas the barriers are lack of time, lack of resources, gender issues, and sole focus on academics [(3)].
Our study results also lie in line with the above study. We have found during our focus group discussion (FGD) among experimental group students that many times they miss their taekwondo class due to academic loads like the need to complete assignments, examinations, and other academic work. We also found through FGD that peer support is a big factor in doing taekwondo practice as a group.

Conclusion

We can conclude that health-related physical fitness is poor among incoming medical students, and they need to be informed about the impact of this on their later lives. Physical activities liked by the students should be encouraged, and time and place should be allotted so that a majority of the students take part in these activities and improve their physical health. Further studies should be conducted to monitor the physical health of medical students as they progress in their studies.

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