# Dimensions of physical wellness among medical students of public and private medical colleges in Pakistan

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## ABSTRACT

**Objectives:** To determine adherence to dimensions of physical wellness among medical students of public and private medical colleges in Pakistan.

**Methods:** This cross-sectional study was carried out from January to July 2011 among 820 students of private and public medical colleges in Karachi, Pakistan.

**Results:** Overall, medical students scored low in dimensions of physical wellness. Private medical colleges students were fond of vigorous activities such as aerobics and swimming, whereas public medical colleges students were involved in moderate intensity activities such as walking and use of stairs ($p$<0.0001). Private students reported to consume more fast food ($p$=0.0001), had less sleep ($p$=0.0001), but attended regular annual medical checkups ($p$=0.009) as compared with their public institute counterparts. Safe practices such as avoidance of tobacco were almost the same.

**Conclusion:** Comprehensive adherence to all dimensions of physical wellness was lacking among medical students.

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Health is professed as a state of wellness of mind, body, and spirit.[1] The physical aspect of wellness is related to taking physical care of the body so as to reduce the risk of illness, fatigue, and injury. Physical wellness (PW) is therefore, based on an assortment of healthy foods, adequate intake of water, ample exercise, and safe practices throughout life[2] to sustain quality of life and perform routine activities without exhaustion. Physical benefits ultimately result in psychological benefits such as improved self-esteem, better self-control, and sound judgment to identify the effects of healthful habits and activities.[1] Physical activity (PA) can be defined as the movement of the body using energy. Only moderate activities such as brisk walking, cycling, and games that improve heart rate or vigorous exercises such as swimming, aerobics, and so forth, that increase both heart rate and breathing are examples of PA with health benefits. It is recommended that adolescents with age range of 12-17 years should take part in moderate-to-vigorous physical activity (MVPA) ≥60 minutes/day to avoid obesity, and the health related disorders due to obesity.[3] The healthy life style factors such as adequate PA, healthy diet, non-smoking, and sufficient sleep help to acquire PW and lower risks of composite cardiovascular disease.[4] In Pakistan, there are public and private sets of medical colleges (MCs), each having its own criterion to induct medical students.[5] The wellness issues become imperative for all MC students due to high levels of stress as a result of the rigors of the medical curriculum, necessary adjustments to the forthcoming challenges, and expectations from the family. It is anticipated that these stresses may result in health impairments, relationship dilemmas, depression, and even death.[5] The awareness of PW at this point may enable these students to be careful on vital signs and cautionary symbols of minor ailments so as to cultivate accountability for their health and seek expert medical assistance when required. The objective of the study was to compare dimensions of PW in both sets of medical students in terms of PA, lifestyle choices, and safe practices. The results of our present study are expected to be helpful in continuation of efforts to make emerging doctors, responsible for their own health, of their family, as well as community.

**Methods.** This cross-sectional study was carried out in 3 private, and 5 public sector MCs in Karachi, Pakistan after approval from the Ethical Review Board of Bahria University Medical and Dental College, Karachi, Pakistan. The self-administered questionnaire to evaluate certain aspects of PW was tailored from the wellness wheel and several published studies by the researchers.[1,6] The questionnaire was pretested and verified (validated) on a group of 50 students. The reliability of the questionnaire was determined by measuring the related Cronbach's Alpha (Alpha=0.80). A total of 820 medical students; 510 of private, and 310 of public MCs, (18-24 years of age, either gender, and from different ethnic groups) were selected from both MCs using convenient sampling. Students with any acute or chronic illness were excluded from the survey. All respondents were informed in written as well as verbally regarding the purpose of the survey. All variables were judged based on a 4-point Likert type scale (always, mostly, sometimes, and never) and scores ranged from 0-3, from lowest to highest ranks.

***Statistical analysis.*** Data was analyzed using Predictive Analysis Software (PASW 18.0). Before comparing wellness scores of public and private sector students, normality test was run using Shapiro-Wilk's test. The *p*-value of the test was less than 0.05; thus, it was considered that wellness scores were non-normally distributed. Comparison of PW scores were then assessed by Mann Whitney U Test. Categorical variables were analyzed as frequencies and percentages whereas mean ± standard deviation (SD) was computed for measurement variables like scores of different items of PW. Chi-square test was used to check distribution of responses between private and public sector MCs with *p*-value less than 0.05 as the level of significance.

**Results.** Out of 820 questionnaires, 736 complete forms were analyzed. The response rate from public MCs was 92.25% (286/310) and refusal rate 7.75%, whereas 450/510 (88% response rate and refusal rate 11.7%) was acquired from private MCs. There were 234 female participants in public institutes, and 292 in private institutes. The average age of private medical students was 19.3 ± 0.84 years, and of public medical students was 19.4 ± 1.11 years. Aggregate scores of most dimensions of PW were found to be insignificant among participants of the public versus private MCs (4.96 ± 1.48 versus 4.99 ± 1.621; $p$=0.757). A few dimensions were significantly different between public and private students. Regarding, dietary choices (**Table 1**), students from private and public MCs reported to have healthy practices of eating fruits and vegetables. The unhealthy eating habit of consuming fast food; more than 3 times a week was 1.56 times more in private students ($p$=0.009). There was no significant difference between the students of private and public MCs in frequent consumption of water. The use of fewer than 5 soft drinks per week was also insignificant although numerically the consumption was more in those consuming fast foods (**Table 1**). **Table 2** shows the element of self-care reported in the form of yearly check-up, three-fourths of private MCs students stated they have annual visits to physicians as compared with one-fourth of public MCs students ($p$<0.0001). Students from both public and private MCs were equally concerned regarding monitoring their weights. Similarly, safe practices such as avoidance of tobacco were not found to be significant ($p$>0.05) between the 2 groups. Adequate sleep was 48.3% times less among private medical students as compared with their counterparts studying in public MCs (**Table 2**). Overall, there was a noteworthy difference in moderate exercise with higher level of activities reported by public MCs ($p$=0.006) (**Table 3**). Participants from public MCs

**Table 1 -** Comparison of dietary choices of private and public medical college students.

| Dimensions/ranks | Public MC n=286 | Private MC n=450 | Total n=736 | *P*-value* |
|---|---|---|---|---|
| ***Prefer to eat fruits and vegetables*** | | | | 0.086 |
| Always | 150 (50.0) | 150 (50.0) | **300** | |
| Usually | 53 (27.2) | 142 (72.8) | **195** | |
| Sometimes | 50 (33.0) | 100 (66.7) | **150** | |
| Never | 33 (36.3) | 58 (63.7) | **91** | |
| ***Take fast food 3 times a week*** | | | | 0.009 |
| Always | 39 (27.9) | 101 (72.1) | **140** | |
| Usually | 30 (38.5) | 48 (61.5) | **78** | |
| Sometimes | 150 (51.5) | 141(48.5) | **291** | |
| Never | 67 (29.5) | 160 (70.5) | **227** | |
| ***Drink 6-8 glasses of water daily*** | | | | 0.721 |
| Always | 140 (40.6) | 205 (59.4) | **345** | |
| Usually | 56 (34.0) | 109 (66.1) | **165** | |
| Sometimes | 40 (36.7) | 69 (63.3) | **109** | |
| Never | 50 (42.7) | 67 (57.3) | **117** | |
| ***Drink fewer than five soft drinks per week*** | | | | 0.454 |
| Always | 75 (48.4) | 80 (51.6) | **155** | |
| Usually | 78 (34.5) | 148 (65.5) | **226** | |
| Sometimes | 69 (29.0) | 168 (70.9) | **237** | |
| Never | 64 (54.2) | 54 (45.8) | **118** | |

Values were expressed as number and percentages (%), Public MCs - public medical colleges, Private MCs - private medical colleges, *Aggregate *p*-value

**Table 2 -** Comparison of safe practices amongst public and private students.

| Dimensions/rank | Public MC n=286 | Private MC n=450 | Total n=736 | *P*-value* |
|---|---|---|---|---|
| ***Attend yearly checkups by a physician*** | | | | <0.0001 |
| Always | 34 (25.4) | 100 (74.6) | **134** | |
| Usually | 20 (35.7) | 36 (64.3) | **56** | |
| Sometimes | 32 (11.3) | 250 (88.7) | **282** | |
| Never | 200 (75.8) | 64 (24.2) | **264** | |
| ***I keep a check and control on my weight*** | | | | 0.286 |
| Always | 100 (48.3) | 107 (51.7) | **207** | |
| Usually | 57 (26.5) | 158 (73.5) | **215** | |
| Sometimes | 98 (53.0) | 87 (47.0) | **185** | |
| Never | 31 (24.0) | 98 (76.0) | **129** | |
| ***Avoid tobacco products*** | | | | 0.053 |
| Always | 165 (39.8) | 250 (60.2) | **415** | |
| Usually | 103 (40.2) | 153 (59.8) | **256** | |
| Sometimes | 10 (20.8) | 38 (79.2) | **48** | |
| Never | 8 (47.1) | 9 (52.9) | **17** | |
| ***Get an adequate amount of sleep*** | | | | <0.0001 |
| Always | 160 (52.5) | 145 (47.5) | **305** | |
| Usually | 54 (25.9) | 146 (69.9) | **209** | |
| Sometimes | 39 (23.0) | 131(77.1) | **170** | |
| Never | 33 (54.1) | 28 (45.9) | **61** | |

Values were expressed as number and percentages (%), Public MCs - public medical colleges, Private MCs - private medical colleges, *Aggregate *p*-value

scored low and reported a significant difference in the level of PA with vigorous intensity ($p$<0.0001) such as swimming and aerobics. The percentage of public MCs students who never participated in swimming was twice as much as private MCs students (**Table 3**).

**Discussion.** The knowledge of the wellness path enables students not only to realize the association of sound nourishment and functioning of body, but to take responsibility toward care for minor illnesses and hence, modification in their behaviors. The absence of healthy behaviors gives rise to ailments such as obesity, which is associated with raised blood pressure and blood glucose, abnormal lipids, ischemic heart diseases, cancer, insulin resistance, adult-onset diabetes mellitus, pulmonary health risks, and atherosclerotic disease,[8,9] which call for improvement and modification in health life styles and achievement of PW.

**Table 3 -** Comparison of participation in physical activity amongst public and private students.

| Dimension/ranks | Public MC n=286 | Private MC n=450 | Total n=736 | *P*-value‡ |
|---|---|---|---|---|
| ***Participation in outdoor games*** | | | | 0.306 |
| Always | 96 (33.6) | 166 (36.9) | **262 (35.6)** | |
| Usually | 30 (10.5) | 54 (12.0) | **84 (11.4)** | |
| Sometime | 33 (11.5) | 35 (7.8) | **68 (9.2)** | |
| Never | 127 (44.4) | 195 (43.3) | **322 (43.8)** | |
| ***Daily walk for twenty minutes*** | | | | 0.006 |
| Always | 141 (49.3) | 101 (22.4) | **242 (32.9)** | |
| Usually | 30 (10.5) | 48 (10.7) | **78 (10.6)** | |
| Sometime | 50 (17.5) | 8 (1.8) | **58 (7.9)** | |
| Never | 65 (22.7) | 293 (65.1) | **358 (48.6)** | |
| ***Prefer to use car*** | | | | <0.0001 |
| Always | 65 (22.7) | 328 (72.9) | **393 (53.4)** | |
| Usually | 18 (6.3) | 54 (12.0) | **72 (9.8)** | |
| Sometimes | 3 (1.0) | 45 (10.0) | **48 (6.5)** | |
| Never | 200 (69.9) | 23 (5.1) | **223 (30.3)** | |
| ***Prefer to walk*** | | | | <0.0001 |
| Always | 199 (69.6) | 90 (20.0) | **289 (39.3)** | |
| Usually | 13 (4.5) | 23 (5.1) | **36 (4.9)** | |
| Sometimes | 9 (3.1) | 33 (7.3) | **42 (5.7)** | |
| Never | 65 (22.7) | 304 (67.6) | **369 (50.1)** | |
| ***Prefer to use stairs*** | | | | 0.597 |
| Always | 152 (53.1) | 230 (51.1) | **382 (51.9)** | |
| Usually | 15 (5.2) | 4 (0.9) | **19 (2.6)** | |
| Sometimes | 37 (12.9) | 14 (3.1) | **51 (6.9)** | |
| Never | 130 (45.5) | 202 (44.9) | **332 (45.1)** | |
| ***Swimming*** | | | | <0.0001 |
| Always | 28 (9.8) | 112 (24.9) | **140 (19.0)** | |
| Usually | 10 (3.5) | 98 (21.8) | **108 (14.7)** | |
| Sometimes | 13 (4.5) | 43 (9.6) | **56 (7.6)** | |
| Never | 232 (81.1) | 197 (43.8) | **429 (58.3)** | |
| ***Aerobics*** | | | | <0.0001 |
| Always | 15 (5.2) | 99 (22.0) | **114 (15.5)** | |
| Usually | 23 (8.0) | 26 (5.8) | **49 (6.7)** | |
| Sometimes | 20 (7.0) | 25 (5.6) | **45 (6.1)** | |
| Never | 228 (79.7) | 300 (66.7) | **528 (71.7)** | |

Values were expressed as number and percentages (%), Public MCs - public medical colleges, Private MCs - private medical colleges, *Aggregate *p*-value

It is well known that in addition to physiological and genetic determinants, food environment plays an important role in obesity.[9] On the same theme, inquiry of healthy dietary patterns in our study revealed that water, which is a major determinant of diet that increases the weight of food and make it less dense[10] was frequently consumed by private MCs students. These students however showed a diverse pattern and consumed more fast food than public MCs students, and most were not inclined to use fresh fruits and vegetables, which could prevent from and chronic diseases such as asthma and diabetes. The regular consumption of soft drink in all age groups has increased considerably over the last couple of years. These drinks are devoid of nutritional value, are acidic, corrode teeth, decay boney tissues, giving rise to headaches, eye and ear problems, palpitations, breathing difficulties, and infertility.[11] Caffeine, a component of soft drinks can lead to addiction and neurological systems.[11] Though insignificant, it was observed that students of private MCs consumed soft drinks more than public MCs students. Safe practices investigated in our study were sleep, use of tobacco, weight control, and yearly checkups. Private MCs students showed more self-care. Although studies showed that the regular checkups have not been found to be useful in identifying problems, yet there is agreement on the fact that exercise, good weight, and abstinence from tobacco products are adequate to maintain good health.[4] Acquiring healthy behaviors are more important in preventing illness, and this was a positive feature among private MCs students in our study.

Sleep enjoyed for a period of at least 7 hours is the "third pillar" of health over and above diet and exercise, and is associated with significant cardiovascular benefits.[4] In a study conducted on Dutch population,[4] it was observed that short sleep duration was linked with cardio vascular risks attributed to the high incidence of overweight, obesity, hypertension, total cholesterol, triglycerides, and hemoglobin A.[4] In our study, the public MCs students reported to always enjoy adequate sleep more than the other group.

Tobacco smoke contains nicotine, which is a nerve toxin, vasoconstrictor, and causes addiction. Smoking among youngsters is a developing community health problem that deteriorates lung function.[12] Smokers are at an increased risk of death from chronic obstructive

disease as compared with nonsmokers.[13] Moreover, quitting smoking at any age helps in improvement of pulmonary function and compliance. It was observed that private MCs students avoided tobacco products more than their counterparts.

In a study on American children, adherence to PW in all schools was emphasized on the basis of observation that they did not consume diets that met the "Dietary Guidelines for Americans" and lack of participation in recommended PA.[14] Adams[3] emphasized the recommendation of MVPA ≥ 60 minutes for children as well as adolescents for adherence to PW. The results of our study showed that both group of students did not take part in healthy PA, which is required for improvement in cardiovascular and pulmonary functions.[15]

In comparable studies in other parts of the world, health behaviors were questioned in school children.[3,4,14] The selection of medical schools in our study is based on the fact that life style improvements by healthy choices and safe practices by medical students (primary tier) can deliver health messages to their families (secondary tier), and finally to the community (tertiary tier). Once they personally experience and appreciate the value of the relationship between sound nutrition and body performance, that they could effectively disperse messages and also bring on a revolution in the society. The implications of this research follow the recommendations of the American College of Sports Medicine[16] for life style modifications and sport participation for PW.

The present study had limitations as the sample was not representative of perceptions of students from all private and public MCs of Karachi, only a few questions were asked in the questionnaire, the extent of PA was not assessed completely by the questionnaire, and we did not analyze our results gender-wise.

In conclusion, the attitude toward preservation of PW was deficient among all medical students. Some aspects that were known and practiced by private MCs students included regular annual checkups, frequent consumption of water, vigilance on weight control, with participation in aerobics and swimming. Nevertheless, their wellness scores were reduced by consumption of fast food, inadequate sleep, and the habit of using cars instead of walking as compared with public MCs students.

***Future implications.*** It is necessary to make medical students aware of the significance of PW, so that they themselves remain healthy and are able to generate the same awareness in the community. We recommend that "The Student Wellness Program" should be introduced in the curriculum of MCs with the objectives to enrich awareness of health and happiness among students. The students should be taught on the implications of an active and healthy lifestyle to prevent illnesses associated with unhealthy sedentary lifestyles. We also anticipate that the development and implementation of wellness programs, health policies, and sport activities in developing countries such as Pakistan will be able to reduce the stressful occupational training experience of medical students.

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