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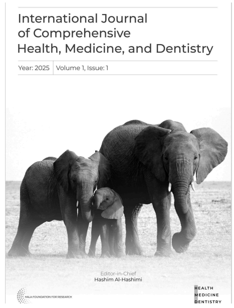

Original Article

Impact of Physical Activity on Medical Students

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Abstract

Background: Medical students must withstand pressures of medical school to succeed while assimilating the stressful culture of medicine.

Methods: This was an analytical cross-sectional study. The questionnaire used was a modified International Physical Activity Questionnaire and Oldenberg assessment to determine their physical health, level of physical activity and perception of exhaustion. Voluntary participants were enrolled after taking informed consent.

Results: Data for 245 students was analysed out of which 108 (44.1%) were male and 137 (55.9%) were female. Low activity levels were found in 27 (9%), moderate in 55 (18.4%) and High in 217 (72.6%) students. Exhaustion was present in 65 (26.9%) students and disengagement was present in 24 (9.4%) students. Students with both academic and clinical responsibilities reported the highest frequency of exhaustion and disengagement, 30.1% and 15.5% respectively. We found a significant negative correlation between MET Scores and both exhaustion score and disengagement score, with r= -0.139 and -0.135 respectively ($P < 0.001$)

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Conclusion: The significant negative correlation between higher MET scores and lower frequency of exhaustion and disengagement shows that higher levels of physical activity in medical students improved their mental health. Our findings highlight the need for integration of physical activities in medical curriculum.

Keywords: Burnout syndrome, Cardiometabolic health, Exercise patterns, Mental health, Health education, Medical education, Pakistan

Introduction

Obesity, defined by the World Health Organization (WHO) as a body mass index (BMI) of more than or equivalent to 30 kg/m^2 is now considered a global epidemic where 39% of adults aged 18 years and over were overweight, and 13% were obese in 2016 (WHO Western Pacific, 2024). Steadily increasing numbers of young adults in addition to middle-aged adults in urbanized low and middle income countries currently suffer from obesity. It is the single most common preventable risk factor. Multiple, severe non-communicable cardiometabolic diseases, such as diabetes, hypertension, cardiovascular disease and cancer, resulting in the death of over 4 million people per year according to the 2017 global disease burden, taking a significant toll on health systems in struggling economies (WHO Obesity, 2024). Young adults, particularly those enrolled as college and university students between the ages of 18 to 25, struggle to maintain healthy levels of BMI and physical activity as they leave home for university or college, marking a significant change in lifestyle (Lowry et al., 2000), from active to sedentary with overconsumption of processed food, often leading to weight gain, which may not be cause for alarm at the time but accrues more harmful effects later in life. Both positive and negative behaviour choices, especially with regards to poor eating habits and low physical activity due to rigours of academic routine and stress, established during this period, persist into adulthood (Poobalan et al., 2014).

Medical schools are a place of intense intellectual, emotional, and physical challenges, where the pressure to succeed is relentless. Students are required to absorb vast amounts of knowledge rapidly while mastering complex clinical skills, often under the scrutiny of experienced professionals. The rigorous academic expectations are compounded by the demanding culture of medicine, which often glorifies endurance, sacrifice, and perfection. This environment can foster a sense of imposter syndrome, as students strive to meet high personal and professional standards. Additionally, the long hours, frequent examinations, and the emotional weight of patient care contribute to chronic stress, burnout, and anxiety. Balancing these demands with personal well-being, relationships, and extracurricular aspirations can seem nearly impossible. The culture of medicine, with its unspoken expectations of resilience and stoicism, often discourages seeking help, leaving students to grapple silently with their struggles. This complex interplay of pressure and cultural expectations underscores the urgent need for systemic support and a more compassionate approach to medical training. Medical students, in particular, must withstand the pressures of medical school to succeed while assimilating the stressful culture of medicine. Ability to cope with these mental pressures is important to health and professional development, as stress in medical student is linked to poor academic performance, burnout, substance use, mental health problems and suicidal ideation. An inability to cope with these factors also disproportionately affects female medical students, who may then be more vulnerable to these adverse outcomes, exacerbated by an underlying cardiometabolic disorder caused by obesity (Mahmood et al., 2010; Phelan et al., 2015; Akram et al., 2018; Memon et al., 2018).

In Pakistan, attention in now being given to the fact that increasing physical activities in students leads to better academic performance, with more strenuous activities like aerobics, linked to improved cerebral blood flow and oxygenation while atherosclerosis from poor dietary habits has a detrimental effect on cognition (Nisar et al., 2009). Predisposition to obesity may therefore hinder future professional growth, ability to function at optimal levels, especially in a fragile healthcare system like Pakistan's. It is imperative that future cardio-metabolic disorders be, hypothetically, predicted from levels of physical activity and corrected with low-cost measures like physical activity (Mahmood et al., 2010; Phelan et al., 2015; Akram et al., 2018; Memon et al., 2018).

Our study aims to identify self-perceived levels of physical activity in medical students across the duration of their degree of study and determine the prevalence of baseline levels of physical activities in order to encourage positive health behaviours. It also explores if there is an association between mental and academic stress and levels of physical activity while controlling for other variables exists in medical students. At the conclusion of our study, the researchers hope to allow participants to realize that their lack of inactivity puts them at risk for adverse health events in the future and jeopardizing their future career growth as physicians, which may be corrected by as simple and cost-effective a measure as increasing their level of physical activity.

Methods

Sample and Setting

A cross-sectional survey was carried out among the medical students enrolled in all years, pre-clinical and clinical, of a five year MBBS program offered at Shifa College of Medicine, Islamabad, after obtaining due approval from Institutional Review Board of affiliated governing institution, Shifa Tameer e Millat University, Islamabad, through certificate number IRB# 1000-275-2018 after in-person presentation of research proposal in meeting of IRB and Ethics Board, under supervision of Chairman of the Board.

The survey was carried out during a seven-month time period spanning from March to September. All participants were young adults of multi-ethnic origin with socioeconomic status ranging from medium to high. As the campus is situated in an Academic Building for Year 1 to 3 and in Shifa International Hospital, Islamabad, for Years 4 and 5, sampling of non-clinical years, being First Year and Second Year, was conducted by collecting all students of one particular year of study in a single designated lecture hall after which questionnaires were passed out by the researchers and returned by the students upon completion, while sampling for Non-Clinical Years was conducted by asking students to fill in the questionnaires at the end of their Small Group Discussion sessions, with all completed questionnaires collected by the facilitator of the session and then collected by the researchers. The sample size required was of 218 subjects out of an intended population of 500 students, calculated using OpenEpi version 3.01 (www.openepi.com), to fulfil the objectives of our study at 95% confidence level. The researchers assumed a 50% prevalence of poor physical activity with a 5% margin of error.

Data Collection

All data was collected by two researchers with the cooperation of various faculty members of Shifa College of Medicine. Printed copies of the questionnaire were used. Anonymity was ensured by not using any personal identifiers on the returned questionnaire, such as name or class registration number. Only the participant’s class serial number was used for data entry purposes. All data was collected in five separate groups that corresponded to year of study in Shifa College of Medicine, Islamabad. Participant privacy was ensured at all level of data collection and analysis. Voluntary participants were enrolled in the project after taking informed verbal consent. Incomplete forms were disqualified and no imputation method was used. After consent, the questionnaire was distributed to all the students irrespective of the class, gender or age to remove any potential bias.

Questionnaire

The International Physical Activity Questionnaire (IPAQ) was chosen as the primary data collection tool for this study due to its reliability, validity, and widespread use in assessing physical activity levels across diverse populations (Craig et al., 2003). The IPAQ is a globally recognized instrument that has been validated across multiple settings and populations, including young adults and medical students. It provides a standardized framework for measuring physical activity in terms of frequency, duration, and intensity, allowing for consistent data collection and comparability across studies. The IPAQ has been adapted and tested in numerous languages and cultural contexts, including in South Asia. This makes it particularly suitable for studies conducted in Pakistan, as it ensures that the questions are accessible and understandable for respondents, thereby improving response accuracy and cultural relevance. The IPAQ categorizes physical activity across various domains (e.g., work-related, transport-related, household, and recreational), providing a holistic assessment of a respondent's activity levels. This broad coverage allows a nuanced view of physical activity behaviours, which is particularly beneficial in a student population with potentially varied activity patterns (Craig et al., 2003).

All participants were provided with a clear and detailed description of the study’s objectives, procedures, and potential risks and benefits. This information was conveyed in plain language to ensure understanding, and participants were informed that their participation was entirely voluntary. Participants were assured that their responses would be kept confidential, with data only presented in aggregate form to prevent identification. Any personal identifiers were excluded from data analysis, and data storage complied with institutional guidelines to protect participant privacy. Participants were informed of their right to withdraw from the study at any point without penalty. Printed copies of the questionnaire were distributed among consenting students of each individual year at the same time to minimize data loss through misplacement or non-submission of questionnaire. Questions required proficiency in English language to be answered. There were no technical medical terms in the questionnaire. A researcher was always present at the time of the administration of the questionnaire to answer any students' queries while filling in the questionnaire.

The first part of the questionnaire was a modified version of the IPAQ Questionnaire. Its free, full version in Urdu language, comprising five themes, was back-translated to English to ensure its applicability. The five themes dealt with Physical Exercise during the respondent's time in medical college, how they get to and from medical college and their activities during free hours on campus, opportunities for physical exercise around home, physical exercise that they do in their free hours and finally, the amount of time they spend resting. These themes correlate to the IPAQ scoring domains of leisure time physical activity, domestic and gardening (yard) activities, work-related physical activity and transport-related physical activity.

Participants quantified their responses in hours or minutes to each itemized question in a particular theme. Responses were measured for seasonal variation by categorizing each activity level for both summer and winter.

The second part of the questionnaire was based on the Oldenberg assessment to determine their perceptions about their level of physical activity and exhaustion. All queries required answering along a Likert scale with response variation from one through seven.

Data Analysis

All data collected was then transferred for statistical analysis to SPSS version 23.0. Scoring Protocol from the official IPAQ website was used in analysing all data acquired. Frequency and percentages for qualitative variables were calculated. Mean and Standard Deviation were calculated for quantitative variables. Tests of Association applied included chi-square, students t-test and ANOVA for multiple groups.

Results

A total of 450 students were approached out of which 245 students filled in the questionnaire correctly and completely, resulting in a cooperation rate of 54.4%. Many students of Clinical Years, being Third through Fifth Years, refused to complete the form citing tiredness or lack of time due to hospital academic commitments. All responses fell in range between the ages of 19 years to 25 years. Participating students were from First Year to Final Year classes, of a five year MBBS program.

Of these participants, 108 were male while 137 were female. Greater participation was seen by female students (55.9%) as compared to their male counterparts (44.1%) (Table 2).

The official IPAQ document of interpretation of data using the IPAQ (Craig et al., 2003), 'Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ), states:

"Data collected with IPAQ can be reported as a continuous measure. One measure of the volume of activity can be computed by weighting each type of activity by its energy requirements defined in METs to yield a score in MET–minutes. METs are multiples of the resting metabolic rate and a MET-minute is computed by multiplying the MET score of an activity by the minutes performed. MET-minute scores are equivalent to kilocalories for a 60 kilogram person. Kilocalories may be computed from MET-minutes using the following equation: MET-min x (weight in kilograms/60 kilograms). MET-minutes/day or MET-minutes/week can be presented although the latter is more frequently used and is thus suggested."

As shown in Table 6, mean MET Score among the participants of our study was 7479 +/- 3820, with no significant difference between MET Scores for males and females (p value=0.436). For males, MET scores was 7250+/- 3325 with a slightly higher score for females at 7844+/-3012. Females also scored somewhat higher than males in domains of Leisure (2731+/-1894 vs 2273+/-1774), Domestic (1916+/-920 vs 1750+/-1123) and Transport (509+/-376 vs 342+/-241). In work domain, male students scored higher than females 2789+/-1612 vs 2622+/-1693. However, these differences were not statistically significant.

Between Years of Study, 3rd Year had a significant lower MET Score in Work domain (2117.78+/-1835.36) as compared with 2nd Year (2482.72+/-1990.76) and 1st Year (2970.69+/-2162.04), which resulted in p=0.019.

Based on their MET scores the respondents were divided into categories of Low, Moderate and High physical activity. Majority of the participants, 182 (72.6%), fell in the category of High physical activity, while the rest fell in Moderate (15.5%) and Low (10.2%) physical activity categories.

The distribution of male and female students was similar in all the physical activity categories. Somewhat more female respondents fell in the High physical activity category (71.5%) than their male counterparts (68.5%). More males were categorized in Moderate physical activity (17.6%) as compared to females (21.2 %). A similar distribution was seen in Low physical activity category with more males falling in it (13.9%) than females (7.3%). A value of p= 0.218 was recorded, which was not significant.

The categories of Exhaustion and Disengagement yielded similar scores for male and female students as shown in Table 4. Overall, mean score for exhaustion was 2.536+/-0.562 and for disengagement 2.178+/-0.581. Mean exhaustion score for male students came out to be 2.547+/-0.572 and for female students 2.528+/-0.556 with a p value equal to 0.800. The disengagement score for male students was 2.186+/-0.628 and for female students was 2.173+/-0.543 with a calculated p value equal to 0.870.

Out of the total respondents, 63 (25.7%) students reported exhaustion and 29 (11.0%) reported disengagement. The percentage of male students reporting exhaustion was slightly higher than female students 28.7 vs 25.8%, p=0.615. The ratio of male and female students reporting disengagement was similar 12.0% vs 11.7%.

Among different classes, 3rd Year reported significantly higher disengagement score ,2.314+/-0.509 as compared with 2nd Year (2.18+/-0.607) and 1st Year (2.05+/-0.602, p=0.011).

There was a significant negative correlation between exhaustion score and MET score, R = -0.139 with p=0.031. There was also a significant negative correlation between disengagement score and MET score, R=-0.135, p=0.032.

The proportion of students with low physical activity reporting exhaustion was significantly higher than those with high physical activity (44.4% vs 22.9%, p=0.039).

Table 1: Physical Activity Categories based on scale obtained from MET Score

Category	**Overall**		**Male**		**Female**		**P-value**
	N	**%**	**N**	**%**	**N**	**%**	
LOW	25	10.2	15	13.9	10	7.3	
MODERATE	38	15.5	19	17.6	29	21.2	
HIGH	182	72.6	74	68.5	98	71.5	0.218
	245		108		137		

N is number; % is percentage, Values represent numbers and percentages where a P value <0.05 is taken as significant. Values are obtained from simple frequency distribution using SPSS

Table 2: Correlation between MET score and Exhaustion, Disengagement scores

		Total MET score	**Exhaustion score**	**Disengagement score**
Total MET score	**Pearson Correlation Coefficient - r**	1	-0.139	-0.135
	P-value		**0.031***	**0.032***
Exhaustion score	**Pearson Correlation Coefficient - r**	-0.139	1	0.34
	P-value	**0.031***		**<0.001***
Disengagement score	**Pearson Correlation Coefficient - r**	-0.135	0.34	1
	P-value	**0.032***	**<0.001***	

Values represent numbers showing correlation between Total MET score along with Exhaustion and Disengagement Scores. Correlation calculated using Pearson's Coefficient in SPSS. P value of less the 0.05 is takes as significant

Table 3: Association of Gender with Exhaustion and Disengagement

Category		Overall		Male		Female		P-value
		N	%	N	%	N	%	
EXHAUSTION	Present	63	25.7	31	28.7	35	25.8	
	Absent	182	74.3	77	71.3	102	74.5	0.615
DISENGAGEMENT	Present	29	11.0	13	12.0	16	11.7	
	Absent	216	89	95	88.8	121	88.3	0.971

N is number; % is percentage, Values representing frequency distribution and association calculated in SPSS. P value of less than 0.05 taken as significant

Table 4: Association of MET category with Exhaustion and Disengagement

Category		Low (25)		Moderate (38)		High (182)		P-value
		N	%	N	%	N	%	
EXHAUSTION (N=63)	Present	10	44.4	13	37.1	40	22.9	
(N=182)	Absent	15	56.5	25	62.9	142	77.4	**0.039**
DISENGAGEMENT (N=29)	Present	5	20.0	5	13.1	19	10.4	
(N=216)	Absent	20	80	33	86.9	163	89.6	0.251

Values represent frequency distributions and associations calculated using SPSS. P value of less than 0.05 was taken as significant.

Table 5: MET Scores according to activity along with Exhaustion and Disengagement scores for study sample

DOMAIN	CLASS	MEAN	S.D.	Sig.
Work MET score	3rd Year	2117.78	1835.363	**0.019**
	2nd Year	2482.72	1990.761	
	1st Year	2970.69	2162.038	
	Total	2530.58	2027.378	
Transport MET score	3rd Year	321.98	642.746	0.237
	2nd Year	481.38	948.011	
	1st Year	511.23	766.771	
	Total	435.62	784.473	
Domestic MET score	3rd Year	1484.60	1546.871	0.067
	2nd Year	1851.42	1962.534	
	1st Year	2187.28	2374.059	
	Total	1843.17	2009.606	
Leisure MET score	3rd Year	2257.26	2905.340	0.527
	2nd Year	2618.46	3064.579	
	1st Year	2725.91	2611.371	
	Total	2529.23	2845.099	
Total MET Score	3rd Year	5332.10	3859.096	0.083
	2nd Year	6113.23	4115.922	
	1st Year	6598.87	3387.419	
	Total	6012.26	3794.994	
Exhaustion Score	3rd Year	2.5131	.60304	0.159
	2nd Year	2.6502	.55936	
	1st Year	2.4766	.51590	
	Total	2.5358	.56180	
Disengagement Score	3rd Year	2.3141	.50873	**0.011**
	2nd Year	2.1766	.60674	
	1st Year	2.0489	.60228	
	Total	2.1784	.58091	

Mean and sample Standard Deviation calculated using SPSS with P value of less than 0.05 taken as significant.

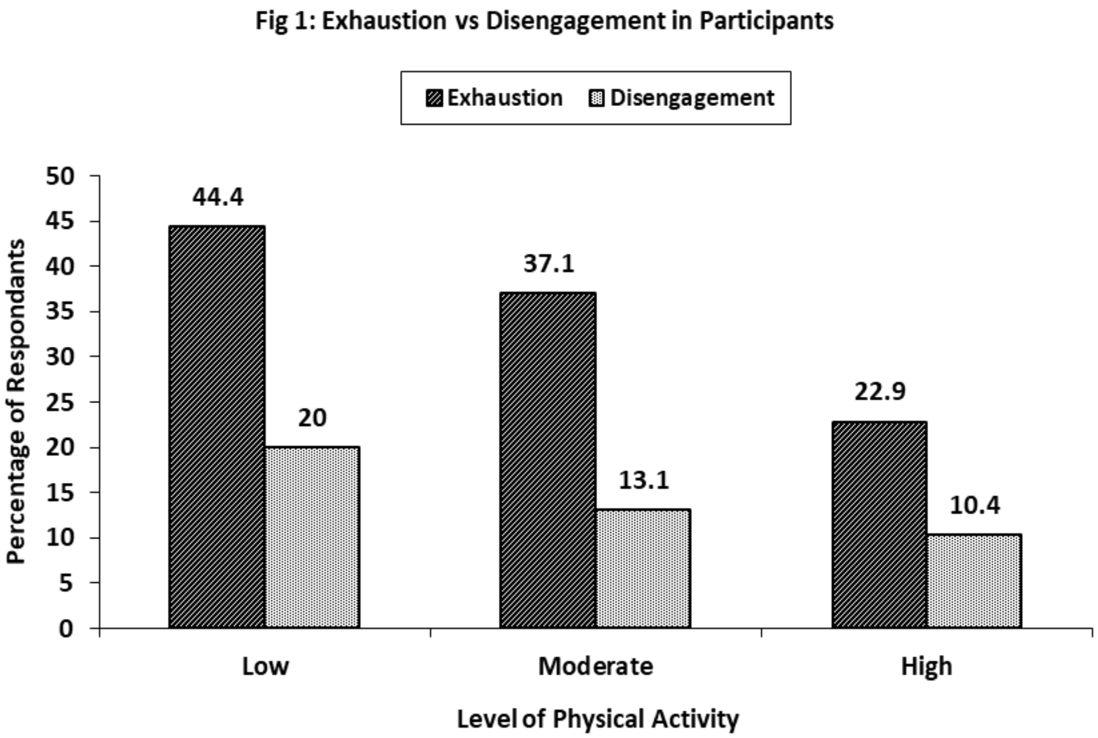

Figure 1: Exhaustion vs Disengagement in Participants

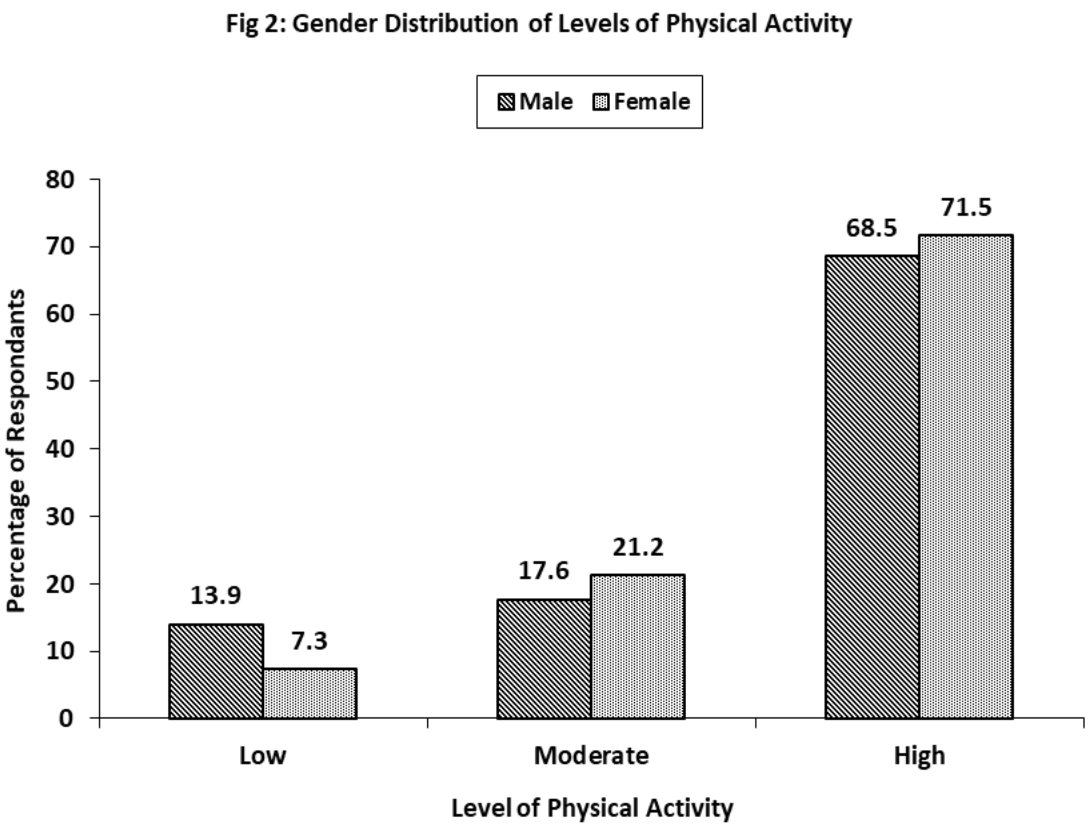

Figure 2: Gender Distribution of levels of Physical Activity

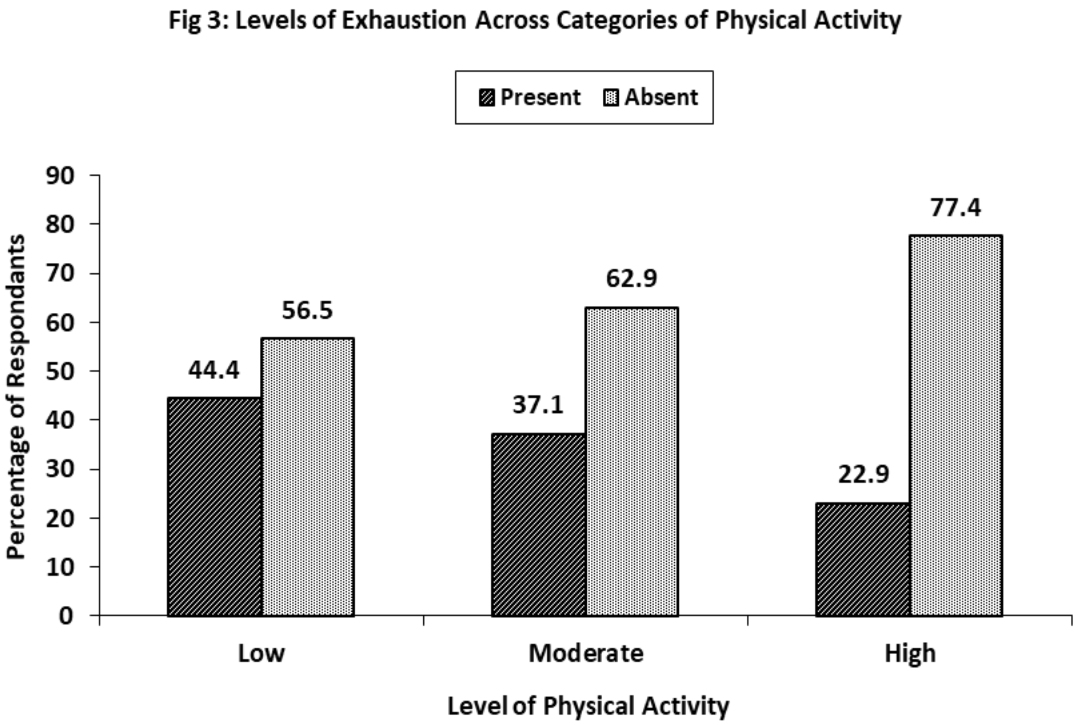

Figure 3: Levels of Exhaustion across Categorical of Physical activity

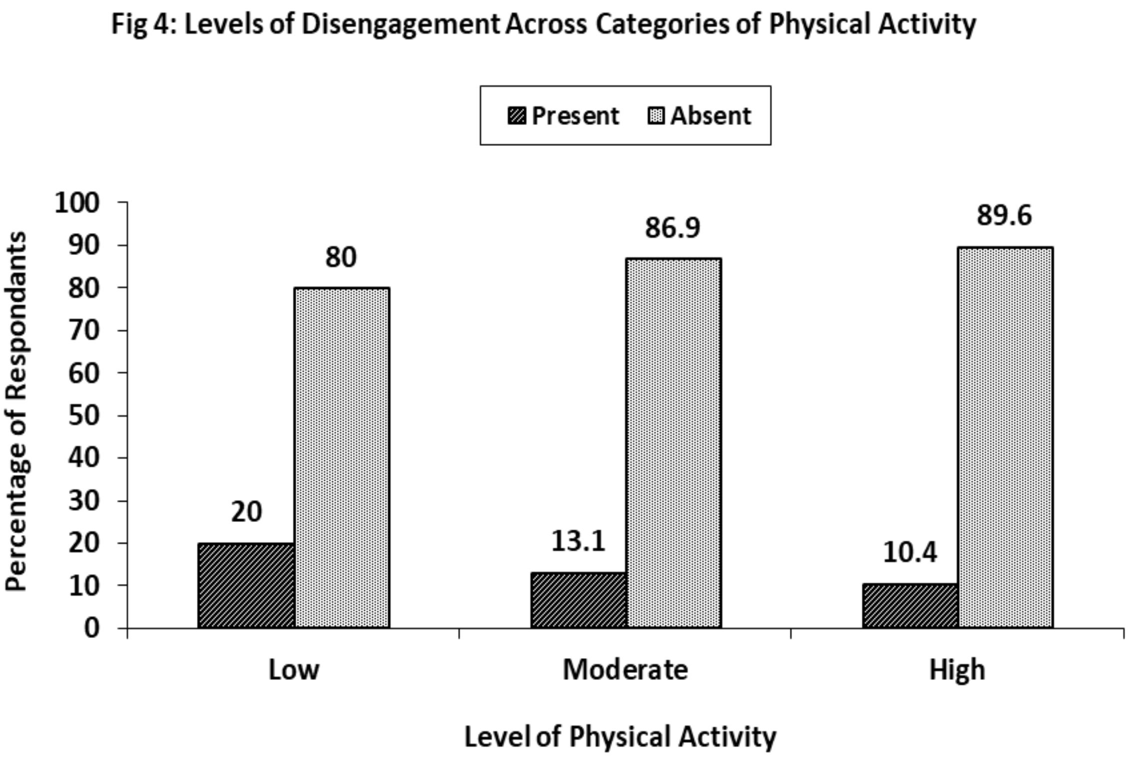

Figure 4: Levels of Disengagement across Categories of Physical Activity

Discussion

In our study, self-perceived levels of physical activity in medical students across the duration of their degree of study were linked with year of study along with levels of exhaustions and disengagement with a strong statistical association between low physical activity and high exhaustion and disengagement.

Given Pakistan's increasing burden of non-communicable disease, the WHO forecasts that Pakistan, like many other low- and middle-income countries (WHO Non-communicable disease, 2023), would also suffer from elevated levels of obesity in the general population, much higher than the global target reduction required by 2025 (WHO global, 2024). As obesity is directly linked to future cardiometabolic disorders in young adults, persisting into adulthood (WHO Obesity, 2024), the importance of low cost interventions like increased physical activity cannot be overstated, especially in a country like Pakistan, where growing population pressures in addition to the burden of obesity and other non-communicable diseases must be countered by young physicians, who are already beset with exhaustion and disengagement in their academic life (Memon et al., 2018).

The low cooperation among fourth and final year students in our study, due to lack of time and multiple academic commitments, correlates strongly with similar studies carried out in Pakistan, which found high levels of stress in the more senior years of medical education (Shaikh et al., 2004; Mahmood et al., 2010; Muzafar et al., 2015; Asghar et al., 2019). This 'lack of time' is itself indicative of the stressful nature of medical education which leads to poor dietary intake of processed, fatty foods and low physical activity putting students further at risk of developing obesity and predisposing them to cardiometabolic disorders. (Nisar et al., 2009; Akram et al., 2018).

More participation by female students was seen in our study along similar trends as observed in other studies conducted in Pakistan, this could be because of the greater number of female students enrolled overall in medical and allied schools (Mahmood et al., 2010; Muzafar et al., 2015; Asghar et al., 2019). Similar to previous studies, female students in our study were found to be more physically active, particularly in domestic and leisure category. This could be because of Eastern cultural constraints of chores around the home, which are delegated more to female members of family than males (Butler et al., 2004). However, similar to studies conducted in the United States (Lowry et al., 2000; Carr and Friedman, 2005; Phelan et al., 2015) and Pakistan (Butler et al., 2004), female students could perhaps be more motivated to engage in higher levels of physical activity because of the stigma that comes from being overweight. Studies have shown that such stigma among medical students not only worsens their health outcomes overall but also contributes to burnout and physician suicide (Crocker et al., 1993; Backović et al., 2012; Phelan et al., 2015; Chunming et al., 2017; Jose and Sruthi, 2019).

Year of Study was found to have an association on the level of physical activity in our study with 3rd Year reporting the lowest levels of physical activity and the highest level of exhaustion and disengagement. As students in our integrated curriculum begin their first clinical engagements in 3rd Year, this could point to increasing academic pressures and course loads which compel them to be sedentary. This phenomenon was also reported in similar studies done in Pakistan, where students linked the excessive emphasis on static assessments to increasing levels of stress and disengagement from medical learning (Muzafar et al., 2015). Interestingly, while many other studies focus on 5th and 4th year as the most stressful years of medical education (Aftab, 2020; Dyrbye et al., 2011; Dyrbye et al., 2006; Wiles et al., 2010), our study indicates that the beginning of such symptoms may actually start as far back as in 3rd Year, or even younger, which may make them the ideal year to focus intervention and counselling for developing healthier habits.

This can be borne out by the fact that a study from Cyprus, found that higher levels of physical activity were strongly correlated with higher levels of happiness and motivation in younger, first year medical students (Fisher et al., 2019) much like the findings in our study, making a strong case for focused interventions beginning from the very first year of medical school to yield positive results in the lives of young training physicians. As in our campus, the Cyprus study also had medical students split for classes in two campuses which points to a further avenue for future research, of whether having split campuses for clinical and academic training are actually more beneficial to students in the long run (Fisher et al., 2019).

Covering long distances between classes on and off campus is also linked to the cardiorespiratory fitness of young medical students and it's correlation with higher BMI has been documented in a study from Pakistan, which found higher BMI to be linked to not just poorer anthropometric parameters compared to their physically active peers but also documented poorer quality of life along with the beginning of concerning dependency on caffeine and other substances to manage the rigors of their academic life (Ali et al., 2020). Without better alternatives to managing with the stress of medical school, future medical students may be more predisposed to developing poorer coping mechanisms in their professional lives (Aftab, 2020).

As one study from Canada documented, poorer nutritional choices made by physicians in a hospital-based setting not only set them up for higher risk of suffering from future psychological issues but also adversely affected their overall physical health as well (Lemaire et al., 2011). This has a serious consequence of poor nutritional awareness in a country already suffering from a poor physician to population ratio of 1:1300, among the worst in the developing world (Muhammad et al., 2023).

Investing in this low-cost and effective intervention (Lowry et al., 2000; Jose et al., 2018) of encouraging medical students to be more physically active will have many long term benefits in the setting of low-resource developing countries like Pakistan, where access to mental health care is already stigmatized and out of the reach of many financially dependent students (Phelan et al., 2015). By investing in this form of primordial prevention, Pakistan's fragile healthcare system will reap the benefit of having more productive young physicians contributing the stabilization of its already fragile health care system (Muhammad et al., 2023).

By encouraging medical students to continue to make positive investments in their physical health by increasing their levels of activity and actively resisting the circumstances that lead to more sedentary lifestyles, and improving their mental health, we can empower a future generation of young physicians to not only improve their likelihood of not falling victim to cardiometabolic diseases, we can also directly improve their productivity and effectiveness as physicians in a resource-poor country like Pakistan. We recommend the establishment of a strong culture of physical wellness within medical institutions in Pakistan, which, in turn, could help reduce the long-term risk of cardiometabolic diseases among future physicians, thereby improving their productivity, well-being, and potential to deliver quality healthcare in resource-limited settings. Institutions can begin by designating specific days each term as "Health and Wellness Days," with no academic classes, devoted entirely to physical activities, workshops, and wellness seminars. These events could serve as a break from academic pressure while providing organized opportunities to engage in fitness and self-care practices. Medical schools should provide dedicated spaces and facilities for physical activity, such as gyms, sports fields, and walking tracks. Where resources are limited, partnerships with local gyms or community sports centres could be established to provide students with discounted memberships. Additionally, organizing sports events and intramural sports leagues could foster a supportive community that values physical fitness and team building. Faculty members who model active lifestyles can have a significant influence on students' perceptions of physical health. Developing a mentorship program where faculty and senior students participate in joint physical activities, such as morning runs or yoga sessions, could create a culture that values and promotes health. Faculty could also provide workshops on managing a healthy work-life balance, helping students build these habits early. They could also create an incentive structure that recognizes students’ commitment to maintaining a physically active lifestyle. For example, awarding certificates or offering additional credit to students who participate in on-campus fitness events, community health runs, or fitness challenges could foster motivation. Incentives would help make physical activity a valued and celebrated part of campus culture.

In addition to the above mentioned recommendations, balancing academic commitments with physical health interventions during clinical years requires a more proactive and structured approach. Time management is crucial; students can prioritize scheduling regular physical activity, even in short bursts, into their daily routines, such as brisk walks between rotations or quick workouts at home. Mindfulness practices, like yoga or meditation, can also help manage stress and maintain mental clarity. Meal prepping ensures access to nutritious food despite busy schedules, while staying hydrated and avoiding excessive caffeine aids in sustaining energy levels. Support systems, including peer groups and mentors, can encourage accountability for health goals.

Limitations

The cross-sectional nature of the study limits our ability to establish causation, as data were collected at a single point in time, making it difficult to determine whether the observed factors have any causal relationship or if they are merely correlational. Furthermore, without follow-up, it is challenging to track changes in responses over time, which may miss potential trends or shifts in behaviour that could influence the findings. The usage of a self-reporting questionnaire may have introduced potential biases as they rely on the respondents' ability and willingness to accurately recall and report their behaviours. Recall bias, specifically, may cause participants to either overestimate or underestimate certain activities or experiences. For instance, students may over-report engagement in certain health-promoting activities due to social desirability bias or under-report rest and leisure activities if they perceive these as less favourable. This bias can affect the reliability of our data, as the actual behaviours may differ from what is reported.

Conclusion

The significant negative correlation between higher MET scores and lower frequency of exhaustion and disengagement shows that higher levels of physical activity are of benefit to medical students especially in terms of their improved ability to function in a psychosocial sphere. These findings highlight the need for better support services to be made freely available to all medical students in order to meet their specific needs.

Author Contribution

Asmara A. Malik: Conceptualization, Methodology, Data curation, Investigation, Writing-Original draft preparation,

Afrose Liaquat: Conceptualization, Methodology, Investigation, Writing-Original draft preparation, Validation.

Kholood Janjua: Data curation; Formal analysis, Final drafting and approval

Saeed Ullah Shah: Visualization, Methodology, Supervision, Final drafting and approval

All authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Ethical Considerations

The key principles adhered to ensure the ethical validity of this study was ensured. Clearance from the Shifa Ethical Review Committee was obtained in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent from all participants above the age of 18 was a prerequisite. The privacy and confidentiality of all data provided by the participants was maintained at every level of data collection and data analysis. The authors affirm that human research participants provided informed consent for publication

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