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Original Research Article

The sedentary doctors versus the active community: contrasting physical activity patterns from South India

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ABSTRACT

Background: Physical inactivity is a major modifiable risk factor for non-communicable diseases. Despite adequate knowledge of healthy lifestyles, medical professionals may experience reduced physical activity due to occupational demands. Evaluating physical activity levels and identifying associated sociodemographic factors is essential for targeted interventions. This study assessed and compared physical activity patterns among medical professionals and the general public in South India and determined the association between sociodemographic factors and physical activity levels.

Methods: We conducted a community-based cross-sectional study from May to June 2024, involving 50 medical professionals and 50 members of the general public. Physical activity was assessed using the World Health Organization Global Physical Activity Questionnaire. Activity levels were classified as sufficient or insufficient.

Results: The median METS-minutes per week of the general public was higher than that of medical professionals. There was a statistically significant association between sufficient physical activity and lower educational groups and skill level II occupation. The medical professionals engaged in 90% lower odds of work-related physical activity than general public. In contrast, medical professionals engaged in nearly three-fold higher odds of recreational physical activity than the general public did.

Conclusions: The median METS-minutes per week of the general public was higher than that of medical professionals. There was a statistically significant association between sufficient physical activity and lower educational groups and skill level II occupation. The medical professionals engaged in 90% lower odds of work-related physical activity than general public. In contrast, medical professionals engaged in nearly three-fold higher odds of recreational physical activity than the general public did.

Keywords: GPAQ, Physical activity, Medical professionals, Work environment

INTRODUCTION

Physical activity is a fundamental component of human health and well-being. The World Health Organization (WHO) defines physical activity as "any bodily movement produced by skeletal muscles that results in energy expenditure".[1] This includes movements during leisure time, while being transported, and as part of an individual's work. Regular physical activity can help prevent and manage non-communicable diseases (NCDs), improve mental health, and reduce the risk of morbidity and mortality.[2] For adults aged 18 years and older, the WHO recommends at least 150-300 minutes of moderate-intensity aerobic physical activity per week or 75-150 minutes of vigorous-intensity aerobic physical activity per week. These recommendations highlight minimum threshold of activity required for substantial health benefits.[1]

Despite these benefits, physical inactivity remains a leading risk factor for mortality, as those who are insufficiently active have a 20-30% increased risk of death compared to people who are sufficiently active.[2] Lives are becoming increasingly sedentary because of a lack of physical activity during leisure time and at work and at home. Work environments often demand long hours of sitting, while modes of transport and entertainment have gradually moved towards minimal physical effort.[3]

Consequently, there is a mismatch between the known benefits of exercise and the actual behaviours of individuals. This paradox is evident among medical professionals. While the medical profession plays a profound role in knowledge regarding the importance of physical activity and the promotion of healthy lifestyles and is expected to counsel patients on healthy lifestyle behaviours, the extent to which medical professionals personally adhere to these recommendations in daily life is questionable.[4-7] Comparing medical professionals with the general public provides valuable insights into how occupational factors and lifestyles affect physical activity patterns.

This study aimed to assess and compare physical activity patterns among medical professionals and the general public aged 18 years and above in a local government unit located in Northern Kerala, India, and to determine the association between sociodemographic factors and physical activity levels.

METHODS

A community-based cross-sectional study was conducted among the residents of a local government unit, namely Perinthalmanna, located in Northern Kerala, India. The study population comprised two distinct groups: doctors of modern medicine registered with the Indian Medical Association (IMA), Perinthalmanna branch, and individuals from the general public aged >18 years, excluding doctors. Participants were recruited using systematic random sampling. From the IMA membership list, 50 doctors were recruited, and 50 non-doctors were selected from local electoral rolls. The study was approved by the Institutional Ethics Committee. Informed written consent was obtained from the participants before the start of the study. Consent to publish the results without revealing their identity was also obtained from all participants. Confidentiality of the participants were maintained during every stage of the study.

The minimum sample size required was 32 individuals from each group, calculated assuming the proportion of low physical activity of 54.5% among the doctors and the proportion of low physical activity of 22.5% among the general public at a 95% confidence level and 80% power using the formula[3,4]

$$n = \frac{(Z_\alpha + Z_{1-\beta})^2 * (P_1Q_1 + P_2Q_2)}{(P_1 - P_2)^2}$$

Data were collected between May 1, 2024, and June 30, 2024, using a semi-structured investigator-administered questionnaire. The Global Physical Activity Questionnaire (GPAQ), developed by the World Health Organization (WHO), was used to collect information on physical activity in three domains: work, travel, and leisure.[8] Energy expenditure was calculated using metabolic equivalents (METs). Based on WHO guidelines, 4 METs were assigned to moderate activities and 8 METs to vigorous activities.[9] Sufficient physical activity was defined as ≥600 MET-minutes per week, while insufficient physical activity was defined as <600 MET-minutes per week.[1]

The sociodemographic variables collected included age, sex, education, occupation, marital status, and type of family. Education and occupation skill levels were classified according to the National Classification of Occupations 2015. The education groups were classified as having primary, secondary, first-degree university, and postgraduate university degrees. Skill levels were classified into I-IV based on the complexity of the task. Skill level I involves simple routine physical and manual tasks. Skill level II involves operating machinery and electronic equipment. Skill level III involves complex technical and practical tasks. Skill level IV involves complex problem solving, decision making and creativity.[10]

Data were analyzed using SPSS version 29. The quantitative variables were summarised as mean with standard deviation for normally distributed variables and median with first and third quartiles for not normally distributed variables. The qualitative variables were expressed as percentages and proportions. The association between the sufficient physical activity and socio-demographic factors were checked using chi-square test and Fischer exact test wherever appropriate. Odds ratios with 95% confidence intervals were calculated to report the strength of association between total physical activity and its domains (work-related activity and recreation-related activity) in the two groups, namely, medical professionals and the general public, as well as sufficient physical activity vs. sex of the general public. Spearman rank correlation was used to check the relation between age and METS-minutes per week. Mann-Whitney U test was used to check the difference in physical activity in terms of METS-minutes per week in the two groups – the medical professionals and the general public. The statistical significance was set at $p<0.05$.

RESULTS

The general public were aged between 20 and 71 years, while the medical professionals were aged between 24

and 73 years. The mean age and standard deviation of the general public was 42.46 (13.86) years. The median age and quartiles of the medical professionals were 34 (28.75, 44.5) years. The sociodemographic factors of the study population are shown in Table 1.

Table 1: Distribution of sociodemographic factors in general public vs medical professionals.

Sociodemographic factors	General public (n=50)	Medical professionals (n=50)	Total population (n=100)
Age in years (mean/median)	42.46 (13.86)	34 (28.75, 44.5)	39.5 (29,47)
Females, N (%)	27 (54)	22 (44)	49 (49)
Nuclear family, N (%)	44 (88)	37 (74)	81 (81)
Married, N (%)	46 (92)	39 (78)	85 (85)
Post graduates, N (%)	0	39 (78)	39 (39)
Secondary education, N (%)	28 (56)	0	28 (28)
Skill level II, N (%)	17 (34)	0	17 (17)

Table 2: Comparison of physical activity patterns in medical professionals and general public.

Physical activity patterns	General public (n=50)	Medical professionals (n=50)	Total population (n=100) OR (95% CI)
Work related, N (%)	14 (28)	40 (80)	0.1 (0.04-0.25)
Transport related, N (%)	14 (28)	19 (38)	0.63 (0.27-1.47)
Recreation related, N (%)	43 (86)	34 (68)	2.89 (1.07-7.82)
Sufficient physical activity, N (%)	31 (62)	45 (90)	0.18 (0.06-0.54)

The GPAQ scoring revealed that the median total physical activity in METS-minutes per week was 890 (600, 1310) METS-minutes per week. Figure 1 showed the comparison of total physical activity in general public and medical professionals. The median physical activity in terms of METS-minutes per week of the medical professionals [620 (480, 1015) was lower than that of the general public [1060 (800, 1930)], which was statistically significant (U=1861.5, p<0.001)]. This implies that the general public engaged in substantially more physical activity than the medical professionals.

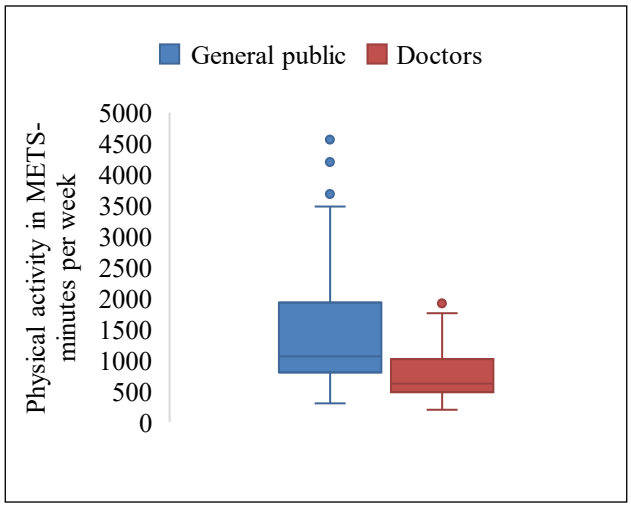

Figure 1: Box and whisker plot comparing the total physical activity of general public and medical professionals.

Age of the general public was negatively correlated with physical activity in METS-minutes per week (Spearman rho = -0.361, p=0.01). As the age of the general public increases, the physical activity in METS-minutes per week decreases (Spearman rho=-0.361, p=0.01). However, an inverse pattern of age and physical activity levels was not observed among medical professionals.

Among the general public, females had 1.2 times the sufficient physical activity compared to males [OR=1.211 (1.004-1.46)]. Among the medical professionals, there was no significant difference in physical activity between men and women.

Individuals with lower educational levels had higher METS minutes per week, which was statistically significant. Similarly, individuals with skill level II occupations were associated with higher METS minutes per week, which was statistically significant. The general public had a lower level of education and engaged in skill level II occupations. This reveals that sufficient physical activity was attained by the general public compared to medical professionals. However, no statistically significant association was observed between physical activity and marital status or type of family in either group.

Sufficient physical activity (≥600 MET-minutes per week) was observed in 90% (81.7%-98.3%) of the general public and 62% (48.6%-75.5%) of the medical professionals. The medical professionals had 82% lower odds of sufficient physical activity (≥600 MET-minutes

per week) than the general public [Odds ratio (OR)=0.18 (0.06-0.54)].

The physical activity among general public and medical professionals were assessed using GPAQ across work, transport and recreation related activity are showed in Table 2. The medical professionals engaged in 90% lower odds of work-related physical activity than general public. [OR=0.1 (0.04-0.25)]. In contrast, medical professionals had nearly three-fold higher odds of recreation-related physical activity than the general public [OR=2.89 (1.07-7.82)]. This contrast in physical activity across work and recreation domains reveals occupational demands and lifestyle factors affecting total physical activity. Although doctors had higher recreation-related physical activity, their total physical activity levels could not be increased. Therefore, they should focus on increasing work-related physical activity.

DISCUSSION

Our study in South India demonstrated higher median METS-minutes per week in the general public than in medical professionals. The mean METS-minute per week in a Central Indian study of dental healthcare professionals was higher than that in medical professionals in our study (724 vs 620 METS-minute per week).[11] This highlights that the physical activity patterns vary even within healthcare professions. The physical activity levels among healthcare professionals differ depending on the nature and type of work they perform.

In the same context, the prevalence of sufficient physical activity was lower among the medical professionals (62%) compared to the general public (90%) in our study. In contrast, a study conducted in UK reported no significant difference in physical activity among the doctors and the general population.[12] While a US study revealed that the doctors had more physical activity than the general public.[13] These contrasting differences in our study compared to studies worldwide can be attributed to the regional variations, work culture and health system structures.

The low physical activity levels in our study was consistent with studies conducted among doctors , health care workers and medical students in South India, where a high proportion were reported to have low levels of physical activity (25%-64.5%).[4,14,15] Similarly, Newtonraj et al reported a higher prevalence of sufficient physical activity (77.5%) in a rural South Indian population comparable to the general public in our study (90%). This suggests that physical inactivity may be more pronounced among the medical professionals than the general population.[3] In the current study, lower physical activity among younger medical professionals may be attributed to long duty hours, academic commitments, and sedentary work routines, as also suggested in studies among health care workers.[4,16,17]

The declining METS minute per week with increasing age among the general public corresponds to a Middle-East study which reported increasing age leads to decreased muscle strength which in turn leads to lower physical activity. Similar age-related associations have been documented by Newtonraj et al, who reported a decreasing likelihood of adequate physical activity with increasing age.[3] This suggests that the young adults promote and sustain physical activity. The young adults can be encouraged to actively support older adults in adopting and maintaining physical activity.

Among the general public, females were 1.2 times more likely to achieve sufficient physical activity level than males. This is noteworthy because global data often report men to be more physically active than women.[1] This may reflect gender specific patterns of daily life in our South Indian setting, where women engage in domestic chores that meet the physical activity levels. Women's contribution to household is under-recognized. Women can be entry points to health promotion programs, to reinforce their existing activity levels and to channel them into structured exercise.

A statistically significant association was observed between higher METS minute per week and lower educational groups. Similarly, higher MET minutes per week were significantly associated with skill level II occupation in our study. In contrast, skill level IV occupation including doctors, involve in decision making and cognitive tasks rather than physical labour. The MET minutes per week in lower education and skill level II occupational strata likely reflect routine engagement in physically demanding works. This may reflect the demanding occupational profile and work-related constraints of highly educated medical professionals, as noted in previous studies on health care providers.[6,7] These occupation realities explain the inverse relationship of educational level and physical activity levels.

The general public relies on work related physical activity while the medical professionals make up for sedentary jobs with recreational physical activity in our study. This pattern reflects the fundamentally different nature of their occupations. Studies from urban and rural South India have emphasized that work related physical activity contributes substantially to total physical activity.[3,8] In our study, the general public were engaged in skill level II occupation while the medical professionals worked in sedentary, desk or ward-based environment which limits work related physical activity. The low work-related physical activity among doctors observed in this study is consistent with reports among medical faculties and hospital staff, where sedentary work patterns and reliance on motorized transport were common.[6,16] But the higher recreational physical activity among medical professionals is more likely to be intentional and planned. The leisure-time activity alone may not adequately compensate for prolonged inactivity during working hours. This necessitates work environment adapted

models for integrating physical activity into the daily work routines of doctors. For example, integrating short walking or stretching activity breaks in the working hours and using stairs instead of elevators can make a meaningful difference in physical activity among young medical professionals.

It is also important to recognize that doctors from different medical specialties have varying physical activity at work. A study in UK doctors reported that anaesthetists and intensive care had highest physical activity because their work involved frequent movement while radiologists had lowest physical activity since they mostly worked with computers.[12] Similarly the general practitioners in Ireland had higher sedentary work patterns due to long consulting hours.[18] In India, doctors in different medical specialties also have varying work routines, duty durations, sedentary load and opportunities for movement. Future research should explore the physical activity patterns across different medical specialties to help design practical solutions to promote physical activity among Indian medical professionals. The practical solutions should be unique for each medical specialty depending on their specific work flow and duty hours.

CONCLUSION

This community based cross-sectional study among general public and medical professionals in South India revealed that the general public exhibited higher median MET-minutes per week compared to the medical professionals, with a statistically significant association between sufficient physical activity and lower educational groups. The association between sufficient physical activity and skill level II occupation as well as unemployed was statistically significant. Young adults generally have adequate levels of physical activity and therefore they should be encouraged to actively support older adults in adopting and maintaining regular physical activity. Women were more likely to meet sufficient physical activity than men. Women can be encouraged to continue their existing physical activity adding structured exercises. Although the total physical activity predominated in the general public, the domain wise physical activity differed among the general public and medical professionals. While the general public predominantly engaged in work related physical activity, the medical professionals engaged in recreation related activity. These findings emphasize the need for work environment adapted models for integrating physical activity into the daily routines of doctors particularly within the workplace. In addition, future researches should explore the physical activity patterns across different medical specialties because the work routine, duty duration, sedentary load and opportunities for movement vary in different medical specialties.

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