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# Physical activity among dental health professionals in Hyderabad City: A questionnaire survey

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## ABSTRACT

**Background:** To assess and compare physical activity based on age, gender, marital status, education, and employment among dental health professionals in Hyderabad City, India.

**Materials and Methods:** A cross-sectional questionnaire study was conducted among dentists and they were personally interviewed by a single trained interviewer. The frequency (in days) and time (in minutes) spent in doing vigorous- and moderate-intensity activity in a typical week in three domains and sedentary behavior were assessed using 16-item Global Physical Activity Questionnaire. Metabolic equivalents (METs) were used to express the intensity of physical activities.

**Results:** Overall, 60.7% of the 313 respondents were physically active, with activity at work and commuting activity were the main contributors of physical activity. With increasing age, there was a decrease in physical activity with more sedentary behavior, professionals in age group of 21–30 years, who were single, those with Bachelor's Degree and those in teaching field performed activity at work, commuting, and recreational activity for more minutes with overall high MET minutes per week and least sedentary behavior.

**Conclusion:** The prevalence of physical activity was high among dental health professionals.

**Key Words:** Dental, physical activity, professionals, questionnaire, survey

## INTRODUCTION

It is recognized that the growing epidemic of obesity is linked to a recent decline in physical activity levels. Socioeconomic changes have led to profound changes in individual's lifestyle including the adoption of unhealthy food consumption patterns, prevalent tobacco use, alcohol abuse, and physical inactivity. Regular physical activity is an important aspect for prevention of noncommunicable disease (NCD), and inactivity is the fourth largest contributor to global mortality and morbidity.[1]

Physical activity is defined as "any force exerted by skeletal muscles that results in energy expenditure above resting level."[2] It can be in the form of lifestyle activity (such as climbing stairs or brisk walking) or structured exercise or sport, or a combination of these.[3] In daily life, physical activity is undertaken in several domains such as work, transport, and leisure time.

The Centre for Disease Control recommends at least 30 min of moderate-intensity physical activity for at least 5 days per week for adults.[4] According to the World Health Organization (WHO) Health Report,[5] globally around 31% of adults aged

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15 years and over were insufficiently physically active in 2008. Furthermore, Indian Council of Medical Research – Noncommunicable Disease Risk Factor surveillance reported that the job-related moderate- and vigorous- intensity physical activity in urban, slum, and rural population was 35.8%, 55.2%, and 61%, respectively, whereas leisure time, moderate- and vigorous-intensity physical activity was 15.6%, 12.1%, and 14%, respectively.[6]

Health professionals have an important role in guiding patients to adopt healthy lifestyles through behavior modification and mediated intervention. The more the health-care professionals carry out good personal health habits, the more likely they are to counsel their patients on a range of behaviors such as physical activity, smoking, alcohol abusing, and having a balanced diet.[7] McKenna *et al*.[8] concluded that health-care professionals who are physically active themselves are three times more likely to regularly promote physical activity in their patients. Frank *et al*.[9] reported that when doctors demonstrate their own personal healthy habits; patients find them to be more believable and better able to motivate changes in their diet and their physical activity levels.

Dental health professionals are at a greater risk to develop musculoskeletal disorders due to stress onto certain muscles contributed by awkward postures during dental procedures, prolonged static and unsupported sitting, extended work hours, and the impact of working with thin instruments in overextended positions throughout the day.[2] In a study by Sharma and Golchha,[10] 75% of dental practitioners were at a risk for developing work-related musculoskeletal disorders, and the prevalence and severity of these disorders decreased by performing regular specific exercises by 20% and 80%, respectively, thus participation in physical activity throughout life can help in maintaining musculoskeletal health.

Recognizing this importance of physical activity among health professionals, the present study aimed to assess physical activity among dental health professionals in Hyderabad City, using Global Physical Activity Questionnaire (GPAQ).

## MATERIALS AND METHODS

A cross-sectional questionnaire study was conducted to determine the level of physical activity among dentists. The sample comprised all the dentists working in Hyderabad City.

Participants were personally interviewed by a single trained interviewer to gather information on demographics data and levels of physical activity using 16-item GPAQ. Show cards with photographs of different physical activities were used to provide a more objective measure to the respondents.

GPAQ developed by the WHO, measures the frequency (in days) and time (in minutes/hours) spent in doing vigorous and moderate-intensity physical activity in a typical week in three domains and sedentary behavior (P16).[11] The three domains include:

1. Work-related physical activity (P1-P6)
2. Travel to and from places (P7-P9)
3. Discretionary leisure time (recreational) physical activity (P10-P15).

The unit metabolic equivalents (METs) were applied for measuring physical activity energy expenditure. MET is the ratio of work metabolic rates to the resting metabolic rate. One MET is defined as 1 kcal/kg/h and is equivalent to the energy cost of sitting quietly. The frequency, intensity, and the MET values in all three domains and sedentary behavior and the levels of physical activity based on physical activity cutoff value were calculated using GPAQ analysis guide.[11] The cut off values for vigorous activity is 8, for moderate intensity is 4 and for transport activity is 4. The questionnaire was pilot tested and proved to have a good internal validity with a Cronbach's $\alpha$ value of 0.8.

The study was approved by the Ethical Committee of the Institutional Review Board (PMVIDS/PHD/0018/2013). Anonymity and confidentiality of respondents were maintained, and participation was voluntarily.

Statistical analysis was done using Statistical Package for Social Sciences Software (SPSS version 12.0), statistical data 2003 SPSS, Inc., an IBM company, Chicago, Illinois, USA. Independent Student's *t*-test and one-way Analysis Of Variance were used for comparison among the variables. Chi-square test was used to determine the association between the variables. The level of significance (*P* value) was set at 0.05.

## RESULTS

Overall, 85.7% of the 365 dental health professionals agreed to participate in an interviewer-based

questionnaire study. The study included 163 (52.1%) males and 150 (47.9%) females with a mean age of 32.64 ± 5.20 years. The majority of the study population belonged to the age group of 31–40 years (52.7%) and about 73.2% of dental health professionals were married. Majority of the study population had a Master's Degree (MDS: 236 [75.4%]; BDS: 77 [24.6%]) with 33.9% in private practice, 21.1% in the teaching field, and 45% in both private practice and teaching field.

Out of the total sample, 16.6% of participants carried out vigorous-intensity activity at work and statistically significant association was observed with gender ($P$ = 0.00), age ($P$ = 0.002), and marital status ($P$ = 0.00). It was observed that 26.4% of males, 25.2% of participants in the age group of 21–30 years and 37.5% of professionals who were single did vigorous-intensity physical activity. When moderate-intensity physical activity at work was considered, 51.1% of participants carried out and significant difference was noted with gender ($P$ = 0.01), age ($P$ = 0.04), and employment ($P$ = 0.0002), where 57.7% of males, 56.6% of participants in the age group of 21–30 years and 59.6% of professionals employed in both private practice and teaching field performed moderate-intensity activity. A high number of participants in the age group of 41–50 years reported that they did not perform any vigorous-intensity (95.2%) and moderate-intensity (71.4%) activity at work [Table 1].

When activity during commuting was considered, the majority of participants carried out (68%) and further significant difference was observed with all demographic variables except employment. More number of females (76.6%) and around 90% of professionals who were single and those possessing Bachelor's Degree either walked or cycled to places [Table 1].

A very few participants carried out recreational activity (vigorous - 8.63%, moderate - 20.1%) wherein gender and employment ($P$ = 0.001) were significant for both vigorous- and moderate-intensity recreational physical activities, whereas marital

**Table 1: Responses of study population based on physical activity at work, commuting, and recreational activities**

| Variables | Physical activity *n* (%) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | At work | | | | Commuting | | Recreational activities | | | |
| | Vigorous intensity (P1) | | Moderate intensity (P4) | | P7 | | Vigorous intensity (P10) | | Moderate intensity (P13) | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Gender | | | | | | | | | | |
| Male | 43 (26.4) | 120 (73.6) | 94 (57.7) | 69 (42.3) | 98 (60.1) | 65 (39.9) | 21 (12.9) | 142 (87.1) | 41 (25.2) | 122 (74.8) |
| Female | 9 (6) | 141 (94) | 66 (44) | 84 (56) | 115 (76.7) | 35 (23.3) | 6 (4) | 144 (96) | 22 (14.8) | 127 (85.2) |
| *P* | 0.00* | | 0.01* | | 0.001* | | 0.005* | | 0.02* | |
| Age (years) | | | | | | | | | | |
| 21-30 | 32 (25.2) | 95 (74.8) | 72 (56.7) | 55 (43.3) | 107 (84.2) | 20 (15.8) | 9 (7.1) | 118 (92.9) | 27 (21.4) | 99 (78.6) |
| 31-40 | 19 (11.5) | 146 (88.5) | 82 (49.7) | 83 (50.3) | 97 (58.8) | 68 (41.2) | 16 (9.7) | 149 (90.3) | 34 (20.6) | 131 (79.4) |
| 41-50 | 1 (4.8) | 20 (95.2) | 6 (28.6) | 15 (71.4) | 9 (42.9) | 12 (57.1) | 2 (9.5) | 19 (90.5) | 2 (9.5) | 19 (90.5) |
| *P* | 0.002* | | 0.04* | | 0.00* | | 0.72 | | 0.44 | |
| Marital status | | | | | | | | | | |
| Single | 30 (37.5) | 50 (62.5) | 48 (60) | 32 (40) | 72 (90) | 8 (10) | 8 (10). | 72 (90) | 24 (30.4) | 55 (69.6) |
| Married | 22 (9.6) | 207 (90.4) | 110 (48) | 119 (52) | 138 (60.3) | 91 (39.7) | 19 (8.3) | 210 (91.7) | 38 (16.6) | 191 (83.4) |
| Divorced | 0 (0) | 4 (100) | 2 (50) | 2 (50) | 3 (75) | 1 (25) | 0 (0) | 4 (100) | 1 (25) | 3 (75) |
| *P* | 0.00* | | 0.18 | | 0.00* | | 0.74 | | 0.03* | |
| Education | | | | | | | | | | |
| BDS | 16 (20.8) | 61 (79.2) | 40 (51.9) | 37 (48.1) | 70 (90.9) | 7 (9.1) | 5 (6.5) | 72 (93.5) | 17 (22.1) | 60 (77.9) |
| MDS | 36 (15.3) | 200 (84.7) | 120 (50.9) | 116 (49.1) | 143 (60.6) | 93 (39.4) | 22 (9.3) | 214 (90.7) | 46 (19.6) | 189 (80.4) |
| *P* | 0.25 | | 0.86 | | 0.00* | | 0.44 | | 0.63 | |
| Employment | | | | | | | | | | |
| Private | 15 (14.2) | 91 (85.8) | 37 (34.9) | 69 (65.1) | 72 (67.9) | 34 (32.1) | 1 (0.9) | 105 (99.1) | 11 (10.4) | 95 (89.6) |
| Teaching | 11 (16.7) | 55 (83.3) | 39 (59.1) | 27 (40.9) | 51 (77.3) | 15 (22.7) | 6 (9.1) | 60 (90.9) | 21 (32.3) | 44 (67.7) |
| Both | 26 (18.4) | 115 (81.6) | 84 (59.6) | 57 (40.4) | 90 (63.8) | 51 (36.2) | 20 (14.2) | 121 (85.8) | 31 (22) | 110 (78) |
| *P* | 0.66 | | 0.0002* | | 0.15 | | 0.001* | | 0.001* | |

*P*<0.05. *Statistically significant

status ($P$ = 0.03) also played a significant influence in moderate-intensity recreational activity [Table 1].

The total mean number of days spent on vigorous physical activity was 4.51 ± 1.83 and the mean minutes were 42.6 ± 40.9. A statistically significant association in mean days spent was observed only with the level of education ($P$ = 0.03), with professionals having Bachelor's Degree spending on more days (5.31 ± 1.44). However, mean time spent on vigorous physical activity was not significant with any demographic variable. On the other hand, mean days spent on moderate physical activity at work was 4.98 ± 1.52 and the mean minutes were 46.7 ± 61.6. The mean number of days spent was significant with all demographic variables except with gender ($P$ = 0.11). Although professionals in private practice did the activity at work on more days (5.78 ± 1.20), the mean time spent was more with those in teaching field (77.3 ± 103.4) [Table 2].

In case of traveling to and from places, mean days spent was 5.6 ± 1.42 and the mean minutes were 46.7 ± 61.6. The mean number of days spent showed a significant association with all demographic variables, i.e., gender ($P$ = 0.0003), age ($P$ = 0.00), marital status ($P$ = 0.00), education ($P$ = 0.00), and employment ($P$ = 0.00). Nevertheless, a significant difference in mean time spent to travel to and from places was observed only with the age of dental health professionals [$P$ = 0.01, Table 2].

The total mean number of days spent on vigorous-intensity recreational activity was 3.9 ± 1.79 and for moderate–intensity recreational activity was 4.00 ± 1.93, and the mean minutes were 59.0 ± 42.6, 46.8 ± 38.3, respectively. No demographic variables showed a significant difference with mean days spent on vigorous-intensity recreational activity, nonetheless for moderate-intensity recreational activity, marital status ($P$ = 0.01), education ($P$ = 0.0001), and employment ($P$ = 0.0007) were significant. When the mean time was considered for the same, significant difference was observed with employment (for vigorous intensity $P$ = 0.0009) and age (for moderate intensity $P$ = 0.03) [Table 2].

**Table 2: Duration spent on activity at work, Commuting, and recreational activities by study population**

| Variables | Physical activity (mean±SD) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | At work | | | | Commuting | | Recreational activities | | | |
| | Vigorous intensity | | Moderate intensity | | Vigorous intensity | Moderate intensity | Vigorous intensity | | Moderate intensity | |
| | P2 (days) | P3 (min) | P5 (days) | P6 (min) | P8 (days) | P9 (min) | P11 (days) | P12 (min) | P14 (days) | P15 (min) |
| Gender | | | | | | | | | | |
| Male | 4.72±1.76 | 40.69±38.18 | 4.82±1.52 | 41.22±44.44 | 5.24±1.50 | 30.15±32.8 | 3.57±1.80 | 61.19±46.98 | 4.21±1.95 | 47.31±37.15 |
| Female | 3.55±1.94 | 52.22±53.74 | 5.21±1.51 | 54.69±79.70 | 5.93±1.26 | 29.21±22.7 | 5.16±1.16 | 51.6±23.16 | 3.60±1.87 | 46.08±41.22 |
| *P* | 0.08 | 0.44 | 0.11 | 0.17 | 0.0003* | 0.80 | 0.053 | 0.63 | 0.22 | 0.90 |
| Age (years) | | | | | | | | | | |
| 21-30 | 4.78±1.66 | 38.43±28.06 | 5.47±1.34 | 50.0±62.24 | 6.17±1.06 | 31.86±25.6 | 4.00±1.22 | 76.66±42.72 | 4.64±1.83 | 47.85±37.64 |
| 31-40 | 4.00±2.05 | 48.94±57.38 | 4.53±1.57 | 44.57±62.74 | 4.97±1.52 | 25.25±22.01 | 3.56±1.93 | 52.18±42.18 | 3.50±1.84 | 42.20±32.96 |
| 41-50 | 6.00±0.000 | 60.0±0.000 | 5.33±1.21 | 38.33±40.57 | 5.88±1.26 | 50.55±71.6 | 6.50±0.70 | 35.00±35.35 | 3.50±1.84 | 112.5±95.45 |
| *P* | 0.24 | 0.62 | 0.0005* | 0.81 | 0.00* | 0.01* | 0.08 | 0.28 | 0.06 | 0.03* |
| Marital status | | | | | | | | | | |
| Single | 4.80±1.71 | 39.00±28.92 | 5.54±1.35 | 51.87±70.86 | 6.25±1.08 | 32.70±24.21 | 3.75±1.66 | 71.2±47.93 | 4.88±1.92 | 47.00±40.00 |
| Married | 4.13±1.95 | 47.72±53.49 | 4.74±1.54 | 44.95±57.87 | 5.28±1.47 | 28.26±29.70 | 4.00±1.88 | 53.94±40.46 | 3.42±1.76 | 47.23±38.17 |
| Divorced | -±0.00 | -±0.00 | 5.00±1.41 | 25.00±7.07 | 6.00±0.00 | 20.0±0.00 | -±0.00 | -±0.00 | 4.00±0.00 | 30.0±0.00 |
| *P* | 0.19 | 0.45 | 0.009* | 0.71 | 0.00* | 0.45 | 0.74 | 0.34 | 0.01* | 0.90 |
| Education | | | | | | | | | | |
| BDS | 5.31±1.44 | 40.93±28.29 | 5.75±1.29 | 48.25±70.93 | 6.51±0.79 | 32.85±26.56 | 4.60±1.94 | 78.00±62.20 | 5.23±1.64 | 50.0±41.53 |
| MDS | 4.16±1.88 | 43.47±45.74 | 4.73±1.51 | 46.29±58.50 | 5.18±1.45 | 28.07±28.33 | 3.77±1.77 | 54.77±37.52 | 3.55±1.85 | 45.74±37.53 |
| *P* | 0.03* | 0.83 | 0.0002* | 0.86 | 0.00* | 0.23 | 0.36 | 0.27 | 0.001* | 0.69 |
| Employment | | | | | | | | | | |
| Private | 5.33±1.49 | 41.00±34.07 | 5.78±1.20 | 27.97±18.04 | 6.62±0.65 | 28.05±14.6 | 2.00±0.00 | 180.0±0.00 | 5.90±1.22 | 29.54±12.33 |
| Teaching | 3.81±2.13 | 55.0±49.04 | 5.12±1.39 | 77.30±103.46 | 5.86±1.13 | 31.17±23.20 | 4.16±1.94 | 50.0±2.49 | 3.81±1.91 | 49.09±41.73 |
| Both | 4.34±1.76 | 38.46±41.39 | 4.57±1.56 | 40.89±40.00 | 4.67±1.42 | 30.05±36.89 | 3.95±1.79 | 55.7±39.01 | 3.45±1.76 | 51.45±41.01 |
| P | 0.08 | 0.53 | 0.0002* | 0.0008* | 0.00* | 0.81 | 0.55 | 0.009* | 0.0007* | 0.25 |

SD: Standard deviation. $P$<0.05, *Statistically significant

For the total mean, METs minutes per week, activity at work, and recreational activity showed a significant difference for marital status and employment where total MET scores were high for professionals who were single and those in teaching field. The total MET minutes per week for traveling to and from the place was significant with gender ($P$ = 0.01), marital status ($P$ = 0.00), and education ($P$ = 0.00). Likewise, overall MET minutes per week for all physical activity (at work, commuting, and recreational) revealed that professionals who were single (513.63 ± 588.32) and those in teaching field (487.05 ± 670.25) carried out activity for more minutes [Table 3].

In case of mean time (in minutes) spent on sedentary behavior, significant association was seen with age ($P$ = 0.01), education ($P$ = 0.001), and employment ($P$ = 0.0004). It was observed that professionals of age group of 41–50 years (342.85 ± 135.02), MDS (340.32 ± 97.64), and those in teaching field (363.71 ± 114.18) spent more time in sedentary behavior [Table 4].

When the participants were categorized based on the level of physical activity, it was observed that most of the participants were in moderate activity (58.7%) and was statistically significant with all the variables that are considered in the study. Based on the level of physical activity (both moderate and severe), 60.7% of professionals were considered to be active and 39.3% of them were inactive [Table 5].

## DISCUSSION

According to the WHO, health has been defined as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."[12] It is increasingly acknowledged that health is maintained and improved not only through the advancement and use of health science but also through lifestyle choices (diet, physical activity, and hygiene) of the individual. The role of physical environment as a key determinant of health has also been emphasized by the WHO.[12]

Almost 2 million deaths per year are attributable to physical inactivity, thereby making physical activity as the "best buy in public health."[13] Despite the global concern regarding NCDs, increasing obesity and rapid changes in the pattern of work, transport, and recreation; physical activity surveillance and

**Table 3: Physical activity of study population in mean metabolic equivalents per week**

| Variables | Physical activity in mean METs per week (mean±SD) | | | |
|---|---|---|---|---|
| | Activity at work | Commuting | Recreational activity | Total physical activity |
| Gender | | | | |
| Male | 161.81±254.45 | 96.47±155.59 | 70.67±159.04 | 326.93±456.05 |
| Female | 132.47±339.20 | 138.70±158.61 | 40.33±150.37 | 310.23±492.32 |
| *P* | 0.3 | 0.01* | 0.08 | 0.0024* |
| Age (years) | | | | |
| 21-30 | 193.58±317.21 | 169.61±175.18 | 69.92±186.43 | 430.43±525.34 |
| 31-40 | 122.55±294.04 | 77.00±120.71 | 47.33±133.32 | 245.36±433.48 |
| 41-50 | 68.57±130.21 | 108.81±216.39 | 41.90±100.73 | 222.62±280.27 |
| *P* | 2.86 | 13.29 | 0.85 | 0.75 |
| Marital status | | | | |
| Single | 230.31±363.72 | 187.88±170.59 | 98.44±217.58 | 513.63±588.32 |
| Married | 120.44±268.91 | 92.31±147.43 | 41.81±125.56 | 253.34±410.26 |
| Divorced | 60.00±69.28 | 90.00±60.00 | 30.00±60.00 | 180.00±69.28 |
| *P* | 0.01* | 0.0000* | 0.01* | 0.0001* |
| Education | | | | |
| BDS | 182.73±339.31 | 196.36±178.44 | 73.64±200.28 | 451.43±553.60 |
| MDS | 136.33±283.03 | 90.72±142.05 | 50.42±137.74 | 275.70±436.35 |
| *P* | 0.23 | 0.0000* | 0.25 | 0.004* |
| Employment | | | | |
| Private | 83.58±143.33 | 127.78±124.03 | 21.75±87.87 | 231.60±243.92 |
| Teaching | 254.55±502.08 | 145.98±162.61 | 87.88±183.87 | 487.05±670.25 |
| Both | 145.99±238.57 | 94.68±176.02 | 67.13±175.69 | 305.89±475.72 |
| *P* | 0.001* | 0.06 | 0.01* | 0.002* |

SD: Standard deviation; METs: Metabolic equivalents. $P$<0.05, *Statistically significant

**Table 4: Mean time (in min) spent by study population on sedentary behavior**

| Variables | Sedentary behavior in minutes (P16) (mean±SD) | *P* |
|---|---|---|
| Gender | | |
| Male | 289.26±117.74 | 0.22 |
| Female | 341.63±104.86 | |
| Age (years) | | |
| 21-30 | 332.59±99.06 | 0.01* |
| 31-40 | 296.69±120.63 | |
| 41-50 | 342.85±135.02 | |
| Marital status | | |
| Single | 329.62±101.42 | 0.31 |
| Married | 308.49±119.17 | |
| Divorced | 345.00±75.49 | |
| Education | | |
| BDS | 305.32±118.59 | 0.001* |
| MDS | 340.32±97.64 | |
| Employment | | |
| Private | 300.00±100.91 | 0.0004* |
| Teaching | 363.71±114.18 | |
| Both | 302.05±118.85 | |

SD: Standard deviation. *P*<0.05, *Statistically significant

**Table 5: Categorization of study population based on the level of physical activity**

| Variables | Level of physical activity, *n* (%) | | | *P* |
|---|---|---|---|---|
| | Low | Moderate | High | |
| Gender | | | | |
| Male | 63 (38.7) | 98 (60.1) | 2 (1.2) | 0.61 |
| Female | 60 (40) | 86 (57.3) | 4 (2.7) | |
| Age (years) | | | | |
| 21-30 | 30 (23.6) | 94 (74) | 3 (2.4) | 0.0001* |
| 31-40 | 83 (50.3) | 79 (47.9) | 3 (1.8) | |
| 41-50 | 10 (47.6) | 11 (52.4) | 0 (0) | |
| Marital status | | | | |
| Single | 111 (48.5) | 115 (50.2) | 3 (1.3) | 0.0000* |
| Married | 10 (12.5) | 67 (83.8) | 3 (3.7) | |
| Divorced | 2 (50) | 2 (50) | 0 (0) | |
| Education | | | | |
| BDS | 13 (16.9) | 62 (80.5) | 2 (2.6) | 0.0000* |
| MDS | 110 (46.6) | 122 (51.7) | 4 (1.7) | |
| Employment | | | | |
| Private | 41 (38.7) | 65 (61.3) | 0 (0) | 0.03* |
| Teaching | 18 (27.3) | 45 (68.2) | 3 (4.5) | |
| Both | 64 (45.4) | 74 (52.5) | 3 (2.1) | |

SD: Standard deviation. *P*<0.05 *Statistically significant

monitoring are carried out only in few countries.[14] To address this societal issue, action and partnership are warranted across a broad range of sectors and professions, many of which do not have physical activity as a core element.

Health professionals play an important role in guiding patients to adopt healthy lifestyle for prevention of NCD. McKenna *et al*.[8] concluded that health professionals who are physically active themselves are three times more likely to regularly promote physical activity in their patients. Although several studies assessed the prevalence of physical activity among general population,[15-19] there is a dearth of literature among health-care professionals.[2,19,20] Recognizing this importance, the present study was conducted to determine the prevalence of physical activity among dental health professionals in Hyderabad City, Telangana, India.

In this study, GPAQ was employed as it is domain specific (activity at work, commuting, and recreational activity and sedentary behavior), quantifies exposure with cross-cultural application. The validity and reliability are slightly better than other questionnaires (International Physical Activity Questionnaire) and physical activity measures (pedometer).[11]

In the present study, 60.7% of the study group were classified as active (moderate and high), with activity at work and commuting activity being the main contributors to total physical activity. This was comparable with the findings of studies by Trinh *et al*.[15] and Guthold *et al*.[16] On the other hand, Singh and Purohit[20] reported physical inactivity among 68% of dental health-care professionals in India.

In this study, it was observed that activity at work and recreational activity was carried out mostly by males, whereas females (76.7%) engaged more in commuting activity. It was also noted that with increasing age, there was a decrease in physical activity with more sedentary behavior, confirming the report of previous work by McGrady *et al*.[1] Similar results observed in a study done by Frantz and Ngambare,[21] participants below the age of 35 years had higher physical activity promoting practices (51%) than any other age group and males (46%) had high physical activity promoting practices compared to the females (20%).

The current study showed that only 16.6% of participants carried out vigorous-intensity physical activity at work and was not influenced by the variables considered in the study; on the other hand, the majority of the participants (51.1%) carried out moderate-intensity activity at work and all the variables considerably influenced except for gender. On the other hand, Kunene and Taukobong[22] found that nearly two-fifth (38.5%) engaged in vigorous

and almost half (49.5%) in moderate work-related physical activities for at least 10 min continuously. It was observed that the mean number of days spent by the participants in the age group of 31–40 years were less when compared to other age groups. Further participants with BDS degree were more active than MDS professionals, and this might be due to time and age factor. Although professionals in private practice and both did the activity at work on more days (5.78 ± 1.20), the mean time spent was more with those in teaching field (77.3 ± 103.4). The main reasons for this decreased physical activity may be due to the working hours of the clinics and few dentists who work in dental colleges during the day and then continue with their private practice in the evening.

When commuting activity was considered, all the variables had influenced only for the mean number of days spent on activity and not for the mean minutes spent except for the variable age. Professionals who were single, professionals with Bachelor's Degree, and those in teaching field had spent more mean days and time.

It was also observed that most of the respondents did not carry out recreational activity (vigorous - 8.63%, moderate - 20.1%) could reflect limited access to and availability of leisure time. Similar findings were observed in a study done by Kunene and Taukobong,[22] very few engaged in vigorous (23.9%) and moderate (37.6%) sport and moderate, fitness, or recreation physical activities.

In a study by Kunene and Taukobong,[22] age and gender showed a significant relation with activity at work and recreational activity, and the time spent sitting and reclining among participants was significantly related to age. However, in our study, age and gender did not influence activity but age showed a significant relation with sedentary behavior.

When total mean METs minutes per week was accounted, professionals of age group of 21–30 years, professionals who were single, those with Bachelor's Degree and those in teaching field performed activity at work, commuting, and recreational activity for more minutes with overall high MET minutes per week and least sedentary behavior. This finding might suggest the availability of leisure time and less working hours.

Regular physical activity is recommended for all, including dental health professionals as it is one of the keys to counteract the current epidemic of obesity and NCD and musculoskeletal work-related disorders. Ching *et al.*,[23] in his 2-year follow-up study among male health professionals, concluded that both sedentary and nonsedentary activities represent separate domains, each with independent risks for overweight. To increase the rates and quality of future physical activity counseling delivered by doctors, Lobelo *et al.*[24] concluded that medical schools need to increase the proportion of students adopting and maintaining regular physical activity habits. Thus, developing higher physical activity levels in the budding years may limit the in-progress epidemic of childhood, adolescent obesity and resultant adult obesity, and NCD, by establishing the foundations, skills, and attitudes needed for good lifelong habits. (It's a justification for the finding of the study which is required to be mentioned)

However, we acknowledge that our study has few limitations, as it measures reported activity rather than actual activity, thus dental health professionals may be prone to overestimate their exercise habits precisely because they know the benefits of physical activity and what they should be doing and within the confines of the present study general population could not be included.

## CONCLUSION

The prevalence of physical activity (60.7%) was high among dental health professionals in this study, with activity at work and commuting activity being the main contributors to total physical activity. Activity at work and recreational activity were carried out mostly by males, whereas females engaged more in commuting activity and it was also observed that there was a decrease in physical activity with increasing age. All the demographic variables were shown to influence the activity at work and commuting activity. When recreational activity was considered, majority of the respondents had less mean METs per week on comparison to activity at work and commuting activity as they did not carry out recreational activity.

This higher prevalence of physical activity in the study group may be because the respondents were all health professionals and their education, income, and occupation likely led them to engage in healthier behaviors. Since the personal habits of professionals influence their patients, healthy lifestyle should be encouraged, and further efforts should be made to promote activity among those who are physically inactive.

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### Conflicts of interest
The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or non-financial in this article.

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