

# Physical Activity among Secondary Level School Students of Banepa Municipality

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## ABSTRACT

### Background

Physical activity plays a crucial role in overall growth and development of adolescents. Physical inactivity (insufficient physical activity) has been identified as the fourth leading risk factor for global mortality (6% of death globally). Regular physical activity is recommended for the prevention of non-communicable disease and improvement of overall health. Worldwide, 81% of adolescents aged 11-17 years are physically inactive.

### Objective

To assess physical activity and its association with selected variables among secondary level students of selected schools of Banepa municipality.

### Method

A quantitative cross-sectional study was conducted using standard Global Physical Activity Questionnaire. Data were collected from 70 students using convenience sampling technique. Socio-demographic, environmental and lifestyle factor were also included in the questionnaire. Descriptive statistics (frequency, percentage, mean, median) and inferential statistics (Chi square test, Monte Carlo test) were applied using Statistical Package for Social Science Version 25 for data analysis.

### Result

This study found that one sixth of the respondents reported low physical activity. Among males, the figure was 27.3% while in females it was 13.5%. Similarly, 72.7% of males met the World Health Organization recommendation for physical activity ( $\geq 600$  Metabolic Equivalent for Task min/week) and 85.5% of females met the criteria. There was high contribution of recreational domain on physical activity.

### Conclusion

This study concludes that most of the respondents had a high level of physical activity. Total physical activity score was largely contributed by recreational activity. This study did not find any association between levels of physical activity and selected socio-demographic, environmental and lifestyle related variables.

## KEY WORDS

*Adolescence, Global physical activity questionnaire, Physical activity*

## INTRODUCTION

Physical activity is crucial for maintaining a healthy lifestyle, especially among children and adolescents. The World Health Organization (WHO) recommends daily physical activity for various age groups to prevent non-communicable diseases (NCDs) and improve overall well-being. However, physical inactivity has become a global concern, contributing to numerous diseases and mortality.<sup>1</sup>

Nepal, with rapid urbanization, faces increasing NCDs, partly due to changing lifestyles with decreased physical activity levels.<sup>2</sup> Urbanization and modernization have also led to a reduction in public spaces for such activities, along with increased violence, technological dependence, and various conveniences.<sup>3</sup> Adolescents, in particular, are at risk, with a significant portion failing to meet WHO activity guidelines.<sup>1</sup> A study among higher secondary school students in an urban district of Nepal found that 31% of females and 8% of males had low physical activity, with a significant portion not meeting the WHO recommendations.<sup>4</sup> A nationally representative study in Nepal showed high levels of physical activity among the population, but many did not engage in leisure-time physical activity, highlighting a potential area for improvement.<sup>5</sup>

This study aims to assess the level of physical activity and screen time and its association with selected variables among adolescent students in Nepal, providing valuable data for designing school health programs. Additionally, it highlights the importance of promoting physical activity among adolescents, particularly girls, and suggests that access to sports facilities and active commuting can play a role in increasing activity levels.

## METHODS

This descriptive cross-sectional study was conducted at a secondary school of Banepa Municipality in August 2020, which was selected through convenience technique. A total of 70 students conveniently participated in the study, among which 11 responses were invalid and remaining 59 responses were analyzed as per the study objectives.

A Global Physical Activity Questionnaire (GPAQ), which is semi structured tool, was used as a research tool.<sup>4,8</sup> For data collection, an e-mail containing the link to an online consent form and the self-administered questionnaire was sent to the students. Before using the questionnaire, pre-test was performed on approximately 18% of the total sample size (n=13), which was not included in the main study. Approvals were obtained from Institutional Review Board of Kathmandu University School of Medical Sciences (KUSMS) and the principal of selected school. Eligible participants were students (both male and female) studying in grade 09-12, who gave consent.

Descriptive statistics (mean, median, frequency, standard deviation and percentage) was applied to describe socio demographic information, level of physical activity. Monte Carlo test was applied to test the association between level of physical activity and selected variables (gender, type of school, family type, parents' educational level, mode of transport to school, extracurricular activity at school, adequate space to play or walk around home, family support to physical activity and peer support to physical activity, current smoker, current drinker, and screen time). Data was analyzed by using Statistical Package for Social Science (Version 25).

## RESULTS

Table 1 shows the demographic characteristics of the study population. The age of the respondents ranged from 13-17 years and there were more female respondents (n=37) than males. Respondents living in a nuclear families were more common (n=38). Regarding parental education, fathers were most commonly the parent who had completed university level of education (n=29), however nearly one third of the respondents' mother had secondary level education (n=21).

**Table 1. Sociodemographic information of the respondents**

| Characteristics               | Frequency (f) | Percentage (%) |
|-------------------------------|---------------|----------------|
| <b>Gender</b>                 |               |                |
| Male                          | 22            | 37.3           |
| Female                        | 37            | 62.7           |
| <b>Family type</b>            |               |                |
| Nuclear                       | 38            | 64.4           |
| Joint                         | 21            | 35.6           |
| <b>Father education level</b> |               |                |
| Illiterate                    | 5             | 8.5            |
| Primary level                 | 6             | 10.2           |
| Secondary level               | 19            | 32.2           |
| University level              | 29            | 49.2           |
| <b>Mother education level</b> |               |                |
| Illiterate                    | 6             | 10.2           |
| Primary level                 | 11            | 18.6           |
| Secondary level               | 21            | 35.6           |
| University level              | 21            | 35.6           |

Table 2 shows the environmental characteristics of the study participants whereas table 3 represents the lifestyle characteristics. More than half of the respondents used to go to school by walking (n=33) in most days. All the respondents reported having extracurricular activities at school and had family and friends' support for physical activity. Most of them reported having adequate space to play and walk around home (n=38). Similarly, none of the

**Table 2. Environmental-related Information of the Respondents**

| Characteristics                                   | Frequency (f) | Percentage (%) |
|---|---------------|----------------|
| <b>Mode of transport to school</b>                |               |                |
| Walking   | 33            | 55.9           |
| Motorcycle/ four-wheeled                          | 24            | 44.1           |
| <b>Extracurricular activities at school</b>       |               |                |
| Yes   | 59            | 100            |
| <b>Adequate space to play or walk around home</b> |               |                |
| No  | 21            | 35.6           |
| Yes   | 38            | 64.4           |
| <b>Family support to physical activity</b>        |               |                |
| Yes   | 59            | 100            |
| <b>Friend support to physical activity</b>        |               |                |
| Yes   | 59            | 100            |

**Table 3. Lifestyle related Information of the Respondents**

| Characteristics                 | Frequency (f) | Percentage (%) |
|---------------------------------|---------------|----------------|
| <b>Current drinker</b>          |               |                |
| No                              | 59            | 100            |
| <b>Current smoker</b>           |               |                |
| No                              | 59            | 100            |
| <b>Screen time</b>              |               |                |
| Moderate (less than two hours)  | 24            | 40.7           |
| Excessive (more than two hours) | 35            | 59.3           |

respondents smoked or consumed alcohol, however most of them reported excessive screen viewing (n=35).

Table 4 illustrates that the mean value of MET min/week of domain of physical activity among secondary level students was 3939.59 ± 4253.268 min/week. The mean value of domain work was found to be 593.36 ± 1427.227 min/week. For travel and recreational domains, the mean values were 746.78 ± 879.268 min/week and 2599.46 ± 3743.825 min/week, respectively. The mean value of sitting time (minutes per day) of the respondents was 220.68 ± 152.529 min/week.

**Table 4. Domain specific physical activity scores and sitting time**

|        | Physical activity (MET min of PA in a week) |          |              |           |  | Sitting time (Min per day) |
|--------|---|----------|--------------|-----------|--|----------------------------|
|        | Work  | Travel   | Recreational | Total     |  |                            |
| Mean ± | 593.36 ±                                    | 746.78 ± | 2599.46 ±    | 3939.59 ± |  | 220.68 ±                   |
| SD     | 1427.227                                    | 879.268  | 3743.825     | 4253.268  |  | 152.529                    |

Table 5 shows the respondents' level of physical activity, where 25 had high, 23 had moderate, and 11 respondents had low levels of physical activity. Similarly, 16 male and 32 female respondents met the WHO recommendation for physical activity (≥ 600 MET min/week). Almost one sixth of the respondents (6 males and 5 females) reported low physical activity (LPA), as per the GPAQ classification.<sup>10</sup>

**Table 5. Association between physical activity and selected variable.**

| Characteristics                                   | High level (%) | Moderate level (%) | Low level (%) | p value |
|---|----------------|--------------------|---------------|---------|
| <b>Gender</b>                                     |                |                    |               |         |
| Male  | 12 (54.5)      | 4 (18.2)           | 6 (27.3)      | 0.051b  |
| Female  | 13 (35.1)      | 19 (51.4)          | 5 (13.5)      |         |
| <b>Family type</b>                                |                |                    |               |         |
| Nuclear   | 17 (44.7)      | 13 (34.2)          | 8 (21.1)      | 0.763b  |
| Joint   | 8 (38.1)       | 10 (47.6)          | 3 (14.3)      |         |
| <b>Father education level</b>                     |                |                    |               |         |
| Illiterate  | 3 (60.0)       | 2 (40.0)           | 0 (0.0)       | 0.441b  |
| Primary level                                     | 2 (33.3)       | 1 (16.7)           | 3 (50.0)      |         |
| Secondary level                                   | 8 (42.1)       | 7 (36.81)          | 4 (21.1)      |         |
| University level                                  | 12 (41.4)      | 13 (44.8)          | 4 (13.8)      |         |
| <b>Mother education level</b>                     |                |                    |               |         |
| Illiterate  | 2 (33.3)       | 3 (50.0)           | 1 (16.0)      | 0.186b  |
| Primary level                                     | 5 (45.5)       | 2 (18.2)           | 4 (36.4)      |         |
| Secondary level                                   | 10 (47.6)      | 6 (28.6)           | 5 (23.8)      |         |
| University level                                  | 8 (38.1)       | 12 (57.1)          | 1 (4.8)       |         |
| <b>Extracurricular activities at school</b>       |                |                    |               |         |
| No  | 0 (0.0)        | 0 (0.0)            | 59 (100.0)    | NR      |
| Yes   | 25 (42.4)      | 25 (39.0)          | 10 (18.6)     |         |
| <b>Adequate space around home</b>                 |                |                    |               |         |
| Yes   | 18 (47.4)      | 12 (31.6)          | 8 (21.1)      | NR      |
| <b>Family support to physical activity</b>        |                |                    |               |         |
| Yes   | 25 (42.4)      | 23 (39.0)          | 11 (18.6)     | NR      |
| <b>Friends support to physical activity</b>       |                |                    |               |         |
| Yes   | 25 (42.4)      | 23 (39.0)          | 11 (18.6)     | NR      |
| <b>Mode of transportation to school</b>           |                |                    |               |         |
| Walking   | 12(36.4)       | 15 (45.5)          | 6 (18.2)      | 0.542b  |
| Motorcycle/four-wheeled                           | 13(50.0)       | 8 (30.8)           | 5 (19.2)      |         |
| <b>Adequate space to play or walk around home</b> |                |                    |               |         |
| No  | 7(33.3)        | 11 (52.4)          | 3 (14.3)      | 0.424b  |
| Yes   | 18 (47.4)      | 12 (31.6)          | 8 (21.1)      |         |
| <b>Screen time</b>                                |                |                    |               |         |
| Moderate (less than 2 hours)                      | 10 (43.5)      | 09 (39.1)          | 4 (17.4)      | 0.949b  |
| Excessive (more than 2 hours)                     | 15 (41.7)      | 15 (41.7)          | 6 (16.6)      |         |

Significant at p < 0.05

NR: Not Relevant

b: Chi square test (Monte Carlo test)

Moreover, 12 males and 13 females had high levels of physical activity but there was no statistical significance between level of physical activity and gender of the respondents (p = 0.051). Likewise, 17 respondents living in a nuclear family and 8 with a joint family had high levels of physical activity but there was no significant association between level of physical activity and type of family (p = 0.763). Furthermore, there was no significant association

between level of physical activity and level of education of respondents' mother ( $p = 0.44$ ) or father ( $p = 0.186$ ).

Additionally, 33 respondents went to school by walking and 26 respondents went to school by motorcycle/four-wheeled vehicle but there was no significant association between level of physical activity and mode of transportation to school ( $p = 0.542$ ). Similarly, having adequate space to play or walk around home also had no statistically significant relationship with level of physical activity ( $p = 0.424$ ). Furthermore, no association between level of physical activity and screen time of respondents ( $p=0.949$ ) was noted.

## DISCUSSION

A quantitative cross-sectional study was conducted in a school selected using a convenience sampling method to find out the level of physical activity among secondary level students of Banepa Municipality. This study found that one out of six respondents reported low physical activity. A large proportion of respondents met the criteria for WHO recommended physical activity level.

In this study, 18.64% of adolescents did not meet the level of physical activity recommended by WHO ( $\geq 600$  MET min/week), while nearly half of the students (42.37%) had a high physical activity level, consistent with the finding from similar studies conducted in India.<sup>7,9</sup> Similarly, present study shows 27.3% male and 13.5% female respondents have low levels of physical activity, which was different from the results of a similar research done in an urban district of Nepal in 2019.<sup>4</sup> These differences might have occurred due to significant differences in the sample size among the two studies. The result indicates that there is no significant association between the level of physical activity and gender of the respondents. The result was supported by the study conducted in Banke, Nepal.<sup>6</sup> This might be possible as both genders are provided equal opportunity or encouragement to play outdoor games and other physical activities.

This study found a low contribution of work domain on physical activity because very few respondents were involved in activities like household chores, whereas, recreational domain had major contribution on total MET-minutes per week of physical activity achieved by the respondents, which was similar to the studies done in Banke, Nepal, and Bangladesh.<sup>6,7</sup> But a high contribution of work domain in physical activity has been reported by the study conducted among peri-urban Nepalese population in Jhaukhel-Duwakot, Nepal in 2014.<sup>8</sup> The reason for the greater contribution of recreational activities found in present study might be due to age difference in the sample population. For school aged children, recreational activities are more likely to contribute to physical activity whereas for the adult population work domain might have the greater effect.

In the current study, walking was reported as the most commonly used mode of transportation (44%). Walking to school was positively associated with physical activity for both girls and boys, which is consistent with the study conducted in Bangladesh.<sup>7</sup> Moreover the mode of transportation depends upon the distance between homes and school. Similarly, the mean value of sitting time (minutes per day) of the respondents was  $220.68 \pm 152.529$ . This finding was similar to the study that was done among secondary school students of urban districts of Nepal in 2019.<sup>4</sup>

Likewise, in the present study there was no significant association between the level of physical activity and adequate space around the respondent home to play. A study conducted in Banke, Nepal among secondary school students in 2016 reported similar results.<sup>6</sup> In contrast, a study conducted in Bangladesh showed significant association between the level of physical activity and adequate space around the respondent's home, for playing.<sup>7</sup> However, these differences might be due to the difference in sample size.

Regarding screen time activity, this study found that more than half of the respondents (59.3%) had excessive screen time, a similar finding was seen in the study conducted in an urban district of Nepal in 2019.<sup>4</sup>

This study aimed to measure the physical activity level of secondary level school students. The findings of this study can be useful to provide information about the relationship of different variables and with physical activity. We acknowledged that our study had a few limitations. Firstly, data collection occurred during the COVID-19 pandemic, which imposed significant constraints on the study. Due to the nationwide lockdown and school closures, we were limited to a smaller sample size of 70 students, of which 59 responses were valid for analysis, the information of the respondents' activities were based on a time before the lockdown, which might have resulted in a disparity in the responses and thus the results of the study. Additionally, the honesty level cannot be gauged accurately as an online survey was employed to conduct the research. Also, there is a possibility of misinterpretation of the questionnaire by the respondents. Moreover, due to the lockdown, this study was only able to collect data from a single school.

## CONCLUSION

This study concludes that most of the respondents had a high level of physical activity. However, one among six respondents did not meet WHO recommended physical activity level for health. Total physical activity score was largely contributed by recreational activity. This study did not find any association between levels of physical activity and selected socio-demographic, environmental,

and lifestyle related variables. A similar study in the post lockdown period can be conducted to compare the data with that of this study.

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