

Original Research Article

Physical activity levels, blood pressure status, and their correlates among secretariat officers: a cross-sectional study from Bangladesh

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ABSTRACT

Background: Hypertension remains a major global health concern, with sedentary lifestyles contributing significantly to its prevalence. Secretariat officers, due to their desk-bound occupations, face an increased risk of hypertension. Physical activity is associated with blood pressure regulation, but little information is available on its association with government employees in Bangladesh. This study aimed to assess the physical activity level, blood pressure status and their association among secretariat officers in Bangladesh.

Methods: A descriptive cross-sectional study was conducted from January 1 to December 31, 2020 among 255 officers of the Bangladesh Secretariat's Information Communication Technology and Public-Private Partnership ministries. Data assessment included structured questionnaires, physical measurements (BMI, blood pressure), and the international physical activity questionnaire (IPAQ). Blood pressure was grouped according to standard guidelines, and physical activity was classified as low, moderate, and high. SPSS was used to perform statistical analyses, applying chi-square and t-tests to assess significance.

Results: The mean age of the participants was 35.55±6.9 years, with 76.9% male. 25.5% of the respondents were hypertensive, and 11.8% were prehypertensive. 49% of participants were sedentary, 30% met guidelines for physical activity, and 21% remained just below the mark. There was a significant association between overweight and obesity ($p=0.00$) and hypertension, but no significant association between physical activity levels and blood pressure ($p=0.226$).

Conclusions: Hypertension remains common, even among those with moderate to high levels of physical activity, and other contributing factors, such as occupational stress and BMI, must be taken into account. Targeted interventions, such as workplace wellness programs and periodic screening, are recommended to mitigate hypertension risks among secretariat officers.

Keywords: Blood pressure, Government employees, Hypertension, Occupational health, Physical activity

INTRODUCTION

High blood pressure or hypertension has maintained its standing as a substantial global health problem because of its links to cardiovascular diseases and stroke, which both produce premature death.¹ The rising hypertension epidemic affects working people primarily because of inadequate physical activity coupled with sedentary

behaviors.² The prevailing workplace environment of continual sitting combined with minimal physical motion drives the necessity to understand blood pressure regulation since these factors have made management critical.³

Research studies confirm that physical exercise is crucial to cardiovascular health by lowering blood pressure while

decreasing hypertension risk.⁴ The analysis of randomized controlled trials found that aerobic workouts and resistance exercises produce effective blood pressure reduction in patients with hypertension.⁵ Research from longitudinal studies demonstrates that sustained participation in physical exercise leads to fewer hypertension cases.⁶ Poor physical activity rates among office workers create elevated cardiovascular risks.⁷

Rapid urbanization and lifestyle changes, along with increased occupation-related stress, have elevated hypertension rates in Bangladesh, together with other non-communicable diseases in this low and middle-income nation.⁸ A third of Bangladeshi adults have hypertension, and urban office workers face higher risks because they sit during most work hours while doing limited exercise.⁹ Therefore, studies in Bangladesh dedicated to hypertension research have mainly focused on the general population, rural-urban contrasts, and accessibility to healthcare infrastructure.¹⁰ Few studies have observed government secretariat officers' physical activity levels and blood pressure, thus creating a critical research gap.

The combination of occupational stress and heavy workloads functions as a second cause of hypertension within the administrative officer population. Research conducted in Sri Lanka demonstrated that job stress produced a strong relationship with hypertension prevalence levels among public sector staff members.¹¹ The work conditions within South Asian countries are similar, so we should expect comparable hypertension patterns among Bangladeshi secretariat officers. Scientists worldwide show that practicing physical activities at any level can produce significant health advantages through blood pressure reduction and better cardiovascular management.¹² Many developing countries, including Bangladesh, need to increase their use of workplace programs which promote physical activity.

The research objective evaluated physical activity levels and blood pressure status together with their relationship patterns among secretariat officers from Bangladesh. The study analyzed hypertension and physical activity levels among Bangladeshi secretariat officers to establish evidence needed for targeted health interventions. Research findings will boost established knowledge of occupational health while guiding authorities to create better workplace wellness programs.

Knowledge about how physical activity influences blood pressure levels among public sector employees is crucial in developing prevention methods. This study's essential findings will stem from Bangladesh's high hypertension rates, and most individuals work in sedentary office positions. Investigating this research gap will serve both secretariat officers and broader public health initiatives aiming to minimize the hypertension burden in Bangladesh.

Objective

The objective of this study was to evaluate the physical activity levels, blood pressure status, and their correlates among secretariat officers in Bangladesh.

METHODS

A descriptive cross-sectional study was conducted from 1 January 2020 to December 31, 2020, to assess blood pressure and physical activity among Bangladeshi secretariat officers. The study was conducted at the Bangladesh secretariat, targeting the information communication technology (ICT) and public-private partnership (PPP) ministries in Agargaon, Dhaka. A total of 255 participants were selected using a 3:1 sampling ratio, with 192 (75%) from ICT and 63 (25%) from PPP, reflecting the larger workforce in the ICT ministry.

Inclusion criteria

Officers working in information communication technology (ICT) and public private partnership (PPP) with minimum duration of 6 months. Age between 25 to 58 years. Both male and female were included. Those willing to participate.

Exclusion criteria

Severely ill. Those not willing to participate.

Data collection

Data were collected after developing research instruments, selecting the study site, and determining the sample size. At the Ministry of ICT and PPP, face-to-face interviews and checklists were used to ensure privacy. Sociodemographic, behavioral, and physical activity data were gathered using structured questions. Height, weight, BMI, and blood pressure (both arms) were measured using standardized procedures. Participants provided written consent, and measurements followed strict protocols. Data were verified daily, with corrections made to ensure accuracy and consistency.

Ethical consideration

Formal study approval was obtained from the institutional review board (IRB) of NIPSOM. Before the study, each respondent was informed about the research and their full right to participate or refuse to participate in the study. Informed written consent was taken from each of them. Complete assurance was given to the respondents that all the information they provided was kept confidential and that their names or anything that could identify them had not been published or exposed anywhere. That information would be applied only to this study, not any other study. There was no financial benefit for the research proponent or respondent. There was not any physical, social, or

psychological risk, hazard or discomfort for the respondent.

Statistical data analysis

Statistical analysis was conducted using IBM SPSS version 26. Data were analyzed per study objectives. Sociodemographic variables (age, gender, marital status, education, income, medical history) were categorized and coded. Physical activity levels were classified as low, moderate, or high using MET values. Chi-square and t-tests were applied for categorical and continuous variables, respectively. P values <0.05 were considered statistically significant. Results were visualized in tabular format, summarizing descriptive statistics, frequencies, and associations with key variables.

RESULTS

The age of respondents ranged from 25 to 58 years, with a mean age of 35.55±6.91 years. The majority (66.7%, n=170) were aged 30–39 years, while 6.3% (n=16) were between 50-59 years. Among the 255 participants, 76.9% (n=196) were male and 23.1% (n=59) were female. Most respondents were married (79.6%, n=203), while 20.4% (n=52) were single. Antihypertensive drug use was reported by 19.6% (n=50), whereas 80.4% (n=205) had no history of prescribed antihypertensive medication. Additionally, 82.4% (n=210) of respondents reported a history of smoking.

Table 1: Sociodemographic characteristics of the respondent (n=255).

Characteristics	Frequency	Percentage
Age (year)	20-29	34
	30-39	170
	40-49	35
	50-59	16
Mean±SD	35.55±6.9	
Gender	Male	196
	Female	59
Marital status	Single	52
	Married	203
History of anti-hypertensive drug	Yes	50
	No	205
History of smoking	Yes	45
	No	210

Table 2: Distribution of respondents by BMI category (n=255).

BMI (kg/m ²)	Frequency	Percentage
≤18.5	3	1.2
18.5-24.9	158	62
25-29.9	83	32.5
≥30	11	4.3

Table 2 shows majority of the respondents 62% (158) were normal between 18.5-24.9 kg/m², 32.5% (83) were overweight between 25-29.9 kg/m² and 4.3% (11) were obese ≥30 kg/m².

Table 3: Distribution of respondents by blood pressure status (n=255).

BP status	Frequency	Percent
Normal	(SBP<120 mmHg and DBP<80 mmHg)	160
Pre hypertensive	(SBP 120-139 mmHg or DBP 80-89 mmHg)	30
Hypertensive	(SBP≥140 mmHg or DBP≥90 mmHg)	65

Among 255 participants 62.7% (160) respondents had normal blood pressure, 11.8% (30) were prehypertensive and 25.5% (65) respondents were hypertensive.

Table 4: Distribution of respondents by total MET (minute/week) category (n=243).

MET category	Frequency	Percentage
Low	46	18.9
Moderate	124	51
High	73	30
Total	243	100

Above Table 4 contains distribution of respondents by physical activity according to MET category (IPAC-SF). Here, 18.9% (46) respondents used to do low physical activity, 51.0% (124) people used to do moderate type of physical activity and 30% (73) respondents used to do high physical activity.

Among 63.1% (161) underweight or normal respondents 73.9% (119) were normotensive, 10.6% (17) prehypertensive, 15.5% (25) were hypertensive. Among 36.9% (94) overweight or obese 43.6% (41) were normotensive, 13.8% (13) were prehypertensive, 42.6% (40) were hypertensive. Statistical analysis shows significant association between BMI and blood pressure status (p=0.00).

Table 6 shows the association between physical activity and blood pressure status among the secretariate officers of Bangladesh. 18.9% (46) respondents with low physical activity had 52.2% (24) normotensive, 10.9% (5) had prehypertensive, 18.9% (46) had hypertensive. 51% (124) respondents with moderate physical activity had 66.1% (82) normotensive, 13.7% (17) prehypertensive, 20.2% (25) had hypertensive. 30% (73) respondents with high physical activity had 65.8% (48) normotensive, 9.6% (7)

had prehypertensive, 24.7% (18) had hypertensive. Statistical analysis shows no significant association

between physical activity and blood pressure status (p=0.226).

Table 5: Distribution of respondents by BMI with blood pressure status (n=255).

BMI (kg/m ²)	Normotension	Prehypertension	Hypertension	Total	P value
Underweight or normal	119 (73.9)	17 (10.6)	25 (15.5)	161 (63.1)	0.00
Overweight or obese	41 (43.6)	13 (13.8)	40 (42.6)	94 (36.9)	
Total	160 (62.7)	30 (11.8)	65 (25.5)	255	

Table 6: Association between physical activity and blood pressure status among secretariate officers of Bangladesh (n=243).

Physical activity- (minute/week)	Normotension	Prehypertension	Hypertension	Total	P value
Low (<599)	24 (52.2)	5 (10.9)	17 (37)	46 (18.9)	0.226
Moderate (600-2999)	82 (66.1)	17 (13.7)	25 (20.2)	124 (51.0)	
High (>3000)	48 (65.8)	7 (9.6)	18 (24.7)	73 (30.0)	
Total	154 (63.4)	29 (11.9)	60 (24.7)	243	

DISCUSSION

This study aimed to evaluate blood pressure status and physical activity levels among 255 secretariat officers from the information and communication technology ministry and the public-private partnership (PPP) division in Agargaon. Of the total respondents, 192 were from the information and communication technology ministry, while 63 were from PPP. This cross-sectional descriptive study utilized face-to-face interviews with a pretested semi-structured questionnaire and checklist for data collection.

The findings revealed that the majority of the respondents (76.9%) were male. The most represented age group was 30-39 years (66.7%). In comparison, a study conducted by Gupta et al. in India with 6,106 respondents reported that 62% were male, with most participants aged 40-49 years.¹³ Another study by Teh et al in Malaysia, involving 18,231 respondents, found that 51.1% were male, with the largest group (26.2%) aged 25-34 years.¹⁴ The gender distribution in the present study suggests a higher male participation rate in Bangladesh, potentially due to a greater proportion of males in the workforce compared to India and Malaysia.

Marital status analysis indicated that 79.6% of respondents were married. Comparatively, Gupta et al found that 90% of their respondents were married, while Teh et al reported a lower proportion (65.4%).^{13,14}

Body mass index (BMI) analysis revealed that 1.2% of respondents were underweight, 62% had normal weight, 32.5% were overweight, and 4.3% were obese. In comparison, Islam et al reported that 23.2% were normal, 36.4% were overweight, and 40.4% were obese.¹⁵ Teh et al found that 8.3% were underweight, 47.2% were normal, 29.4% were overweight, and 15.1% were obese.¹⁴ The lower obesity rate in the present study may be due to

increased physical activity and greater awareness of cardiovascular diseases.

Blood pressure analysis showed that 62.7% of respondents were normotensive, 11.8% were prehypertensive, and 25.5% were hypertensive. Among hypertensive individuals, 8.2% had systolic blood pressure above 140 mmHg, while 14.1% had diastolic pressure above 90 mmHg. Compared to Gupta et al, where age-adjusted prevalence of normotension was 26.7% in men and 39.1% in women, the prevalence of normotension in this study was higher.¹³

Regarding hypertension, the present study found that only 19.6% of respondents had a history of diagnosed hypertension or were prescribed antihypertensive drugs. In contrast, Yadav et al reported that 72% of respondents had a history of antihypertensive medication use, while Gupta et al found that 72.4% of their population was on antihypertensive treatment.^{13,16} The lower prevalence of diagnosed hypertension in the present study may be due to the younger age distribution and possibly lower awareness or diagnosis rates.

In terms of physical activity, this study found that 18.9% of respondents had low physical activity, 51% had moderate activity, and 30% had high activity levels. A study by Papathanasiou et al reported that 42.8% of respondents had low physical activity, 43.2% had moderate activity, and 14% had high physical activity.¹⁷ The higher proportion of individuals with high physical activity in the present study could be attributed to greater awareness of cardiovascular health, leading to regular exercise such as swimming, running, and bicycling.

Regarding physical activity, Ribeiro et al conducted a study in Brazil and found no significant association between physical activity and blood pressure.¹⁸

Conversely, Islam et al in Bangladesh and Sobgwi et al in Cameroon reported a significant relationship between physical activity and hypertension.¹⁹ In the current study, no significant association was found between physical activity and blood pressure, despite a high proportion of physically active respondents. This finding aligns with Ribeiro et al, suggesting that other factors, such as genetic predisposition and dietary habits, may play a more prominent role in hypertension development.¹⁸

In conclusion, this study provides valuable insights into the blood pressure status and physical activity patterns of secretariat officers. While the findings align with some previous studies, discrepancies in hypertension prevalence and BMI suggest that younger populations may have different risk profiles. The results underscore the importance of promoting hypertension awareness and lifestyle modifications, particularly among working professionals, to prevent long-term cardiovascular complications.

This study had some limitations, including a small sample size and challenges in data collection due to the COVID-19 situation. It focused only on two ministries (information and communication technology and public-private partnership), limiting the generalizability of findings to all secretariat officers in Bangladesh. Additionally, the use of the IPAQ (short form) questionnaire may have introduced recall bias. To address these issues, awareness programs on blood pressure and physical activity should target sedentary secretariat officers, promoting healthier lifestyles. Hypertension screening programs and studies on physical activity and smoking's impact on blood pressure are recommended.

CONCLUSION

This cross-sectional study found that while hypertension prevalence among secretariat officers was lower than normotension, it exceeded prehypertension levels. Physical activity was most common at moderate levels, followed by high and low. BMI distribution showed the highest prevalence in the normal category, followed by overweight, obese, and underweight. Younger participants require attention to prevent early hypertension and related diseases. Hypertension and its risk factors- age, income, education, family history, and BMI- are largely preventable through early screening and lifestyle modifications.

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REFERENCES

1. Bassett Jr DR, Fitzhugh EC, Crespo CJ, King GA, McLaughlin JE. Physical activity and ethnic

- differences in hypertension prevalence in the United States. *Prevent Med.* 2002;34(2):179-86.
2. Biswas T, Islam SM, Islam A. Prevention of hypertension in Bangladesh: a review. *Cardiovasc J.* 2015;7(2):137-44.
3. Caspersen CJ, Pereira MA, Curran KM. Changes in physical activity patterns in the United States, by sex and cross-sectional age. *Med Sci Sports Exercise.* 2000;32(9):1601-9.
4. Börjesson M, Onerup A, Lundqvist S, Dahlöf B. Physical activity and exercise lower blood pressure in individuals with hypertension: narrative review of 27 RCTs. *Br J Sports Med.* 2016;50(6):356-61.
5. Chase NL, Sui X, Lee DC, Blair SN. The association of cardiorespiratory fitness and physical activity with incidence of hypertension in men. *Am J Hypertens.* 2009;22(4):417-24.
6. Gamage AU, Seneviratne RD. Perceived job stress and presence of hypertension among administrative officers in Sri Lanka. *Asia Pac J Public Health.* 2016;28(1_suppl):41S-52S.
7. Chowdhury MA, Uddin MJ, Haque MR, Ibrahimou B. Hypertension among adults in Bangladesh: evidence from a national cross-sectional survey. *BMC Cardiovasc Disord.* 2016;16:1-0.
8. Islam JY, Zaman MM, Haq SA, Ahmed S, Al-Quadir Z. Epidemiology of hypertension among Bangladeshi adults using the 2017 ACC/AHA hypertension clinical practice guidelines and joint National Committee 7 guidelines. *J Hum Hypertens.* 2018;32(10):668-80.
9. Li W, Wang D, Wu C, Shi O, Zhou Y, Lu Z. The effect of body mass index and physical activity on hypertension among Chinese middle-aged and older population. *Sci Rep.* 2017;7(1):10256.
10. Parker ED, Schmitz KH, Jacobs Jr DR, Dengel DR, Schreiner PJ. Physical activity in young adults and incident hypertension over 15 years of follow-up: the CARDIA study. *Am J Public Health.* 2007;97(4):703-9.
11. Salaudeen AG, Musa OI, Babatunde OA, Atoyebi OA, Durowade KA, Omokanye LO. Knowledge and prevalence of risk factors for arterial hypertension and blood pressure pattern among bankers and traffic wardens in Ilorin, Nigeria. *Afr Health Sci.* 2014;14(3):593-9.
12. Rafrat M, Gargari BP, Safaiyan A. Prevalence of prehypertension and hypertension among adolescent high school girls in Tabriz, Iran. *Food Nutr Bull.* 2010;31(3):461-5.
13. Gupta R, Deedwania PC, Achari V, Bhansali A, Gupta BK, Gupta A, et al. Normotension, prehypertension, and hypertension in urban middle-class subjects in India: prevalence, awareness, treatment, and control. *Am J Hypertens.* 2013;26(1):83-94.
14. Teh CH, Chan YY, Lim KH, Kee CC, Lim KK, Yeo PS, et al. Association of physical activity with blood pressure and blood glucose among Malaysian adults: a population-based study. *BMC Public Health.* 2015;15:1-7.

15. Islam SM, Mainuddin AK, Islam MS, Karim MA, Mou SZ, Arefin S, et al. Prevalence of risk factors for hypertension: A cross-sectional study in an urban area of Bangladesh. *Glob Cardiol Sci Pract.* 2015;2015(4):43.
16. Yadav S, Boddula R, Genitta G, Bhatia V, Bansal B, Kongara S, et al. Prevalence and risk factors of pre-hypertension and hypertension in an affluent north Indian population. *Indian J Med Res.* 2008;128(6):712-20.
17. Papathanasiou G, Zerva E, Zacharis I, Papandreou M, Papageorgiou E, Tzima C, et al. Association of high blood pressure with body mass index, smoking and physical activity in healthy young adults. *Open Cardiovasc Med J.* 2015;9:5.
18. Benite-Ribeiro SA, da Silva VV, Lima KL, dos Santos JM. Association between blood pressure, body mass index, eating habits, and physical activity in adolescents. *Sci Med.* 2016;26(4).
19. Sobngwi E, Mbanya JC, Unwin NC, Kengne AP, Fezeu L, Minkoulou EM, et al. Physical activity and its relationship with obesity, hypertension and diabetes in urban and rural Cameroon. *Int J Obes.* 2002;26(7):1009-16.

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