

Level of Knowledge on Hypertension and Associated Factors among Nursing Professionals of a Selected Tertiary Hospital in Bangladesh

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ABSTRACT

Background: Hypertension is one of the major risk factors and a serious medical condition for cardiovascular diseases and can increase the risk of brain, kidney and other vital organs. Levels of knowledge about hypertension among the nurses might contribute effectively to prevent, treat and control the disease of patients. Thus, the objectives of this study were to identify the levels of knowledge about hypertension among nursing professionals of a selected tertiary hospital.

Materials and methods: This cross-sectional study was conducted using the Hypertension Knowledge-Level Scale, which measures 6 dimensions of knowledge about hypertension (Definition, treatment, drug compliance, lifestyle, diet and complications).

Results: There were 182 participants selected by convenience sampling method, among whom 42% nurses were with high knowledge on Hypertension, 28% had moderate knowledge and lastly 30% of them devoid of knowledge on Hypertension. This study revealed that, the level of knowledge on hypertension is strongly associated with socio-demographic status such as, Age ($p < 0.0001$), Education ($p < 0.0001$), Number of Family Members ($p < 0.0001$), monthly family income ($p < 0.0001$), marital status ($p < 0.0001$) and Nursing experience ($p < 0.0001$). Regular 30 minutes' exercise ($p < 0.001$), cooking main foods at home, duration on social media ($p < 0.001$) and duration of Television watching ($p < 0.001$) were found strongly associated with the level of knowledge on Hypertension. Other factors were presence of hypertension ($p < 0.001$), family history of hypertension ($p < 0.006$), presence of diabetes ($p < 0.001$) and respondent's BMI ($p < 0.001$).

Conclusion: Findings of the study draw focus on the importance of considering these attributes for designing training and educational programs for the nurses.

Key words: Hypertension; Knowledge level; Nursing professional.

Introduction

Hypertension, a rapidly increasing global health concern, is the leading cause of Cardiovascular Disease (CVD) and early death, particularly among adults.^{1,2} Hypertension is defined as persistent Systolic Blood

Pressure (SBP) of at least 130 mm Hg or Diastolic Blood Pressure (DBP) of at least 80 mm Hg. According to the WHO, hypertension occurs when the pressure in your blood vessels is abnormally high (140/90 mmHg or greater).³

It is a significant public health issue causing stroke, heart attack, heart failure, kidney damage and other health concerns.⁴ Globally, 3.5 billion persons have non-optimal systolic blood pressure (>110 - 115 mmHg), whereas 874 million have systolic blood pressure ≥ 140 mmHg. Thus, nearly one out of every four persons has hypertension.^{5,6} Moreover, around 4 billion people were predicted to suffer globally from hypertension in 2019, leading to an estimated 10.8 million avoidable deaths every year and a burden of 235 million years of life lost or lived with a disability.^{2,7} The prevalence of hypertension has risen, particularly in low- and middle-income nations. Adult hypertension prevalence was greater in low- and middle-income countries (31.5%, 1.04 billion persons) than in high-income countries (28.5%, 349 million).⁸ According to WHO, 1.28 billion adults aged 30–79 years worldwide have hypertension, most (Two-thirds) living in low- and middle-income

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countries and 13% of global deaths and three-quarters of the world's hypertensive population reside in low- and middle-income countries.^{2,9}

Bangladesh is one of those countries experiencing an epidemiological transition from communicable to non-communicable diseases.⁹ Hypertension has increased drastically in Bangladesh, with over 38.7% of urban people suffering from hypertension in 2011 and 22.6% in 2017-18.¹ This is one of the top three causes of mortality and disability in Bangladesh.¹⁰ In Bangladesh, one out of every five individuals (21%) has hypertension.¹¹ Hossain et al. analyzed the recent Bangladesh Demographic and Health Survey (2017–2018) data and found that 12.2% of the respondents had diagnosed HTN, whereas 15.8% had undiagnosed HTN.¹² Another study by Roy et al., found a 34.4% prevalence of hypertension among participants, among whom 46.2% under 40 years, 65% were newly diagnosed.¹⁰

Research on hypertensive patients' experiences is limited, highlighting the need for more understanding of challenges, management methods and treatment requirements for effective interventions.¹³ Treating hypertension is one of the most important interventions to meet the Sustainable Development Goal (SDG) target 3.4 of a one-third reduction in premature mortality from the leading non-communicable diseases.² Nurses in Bangladesh have an essential function in the management of hypertension, including identification, treatment and patient education.¹⁴ Nurses in primary health care settings are major stakeholders in the diagnosis and treatment of patients with hypertension.¹⁵ However, in Bangladesh, most of the nurses are not properly aware of the management of hypertension and also their education level is not so updated.¹⁶ A study by Begum et al. found that 70.4% of nurses in Dhaka attended hypertension training, 92.2% knew about normal blood pressure measurement, 82.6% understood hypertension management aims to prevent morbidity and mortality and 39.1% knew the recommended diet for hypertension patients, out of 115 participants.¹⁷ Another study in Bangladesh to know the Assessment of Nurses' Knowledge Regarding the Risk Factors of Hypertension found that the level of knowledge about the risk factors of hypertension was 42% moderate level of individuals.¹⁸ Therefore, the purpose of this study is to analyze the degree of knowledge about hypertension among nursing personnel in a tertiary hospital, finding gaps and opportunities for improvement care of hypertensive patients.

Materials and methods

The research conducted a cross-sectional study utilizing quantitative data, acquired from female nursing professionals at Shaheed Suhrawardy Medical College Hospital (SSMCH) in Dhaka, Bangladesh. The required sample size was determined using the formula: $n = (Z/2/2)^2 \times (1 - P)/W^2$, resulting in a total of 182 participants. Data were gathered through interviews conducted between September 2020 and February 2021. Participants were selected using convenience sampling, with inclusion criteria requiring them to be female nursing professionals who were physically and mentally fit and actively employed at the specified hospital.

Data collection performed through self-administrated questionnaire by face-to-face interview, often taking consent through convenience sampling model.

Data analysis performed by appropriate statistical methods using SPSS software. To evaluate the association among variables, we used statistical tests such as bivariate correlation, Fisher's exact χ^2 test and linear regression analysis, while socio-demographic factors, seeking care-seeking behavior, and features of nearest health care centers were used as independent variables with an 85% Confidence Interval (CI) for each category.

In this study the level of knowledge based on the HKLS score was as follows.¹⁹

- □ Low level of knowledge on HTN = <16 in HKLS score
- □ Moderate level of Knowledge on HTN = 16 to 19 in HKLS score
- □ High level of knowledge on HTN = 20 to 22 in HKLS score

Institutional clearance from the Ethical Review Committee of the Faculty of Health and Life Sciences of Daffodil International University (Ref. No. FHLS-ERC/DIU/2020/0011) and informed consent from the participants were properly obtained.

Results

Among the respondents, 71 (39%) of the 182 nurses whose sociodemographic data the study evaluated were between the ages of 25 and 34. The majority, 97 (53.3%), had an MPH or master's degree in nursing, and 146 (80.2%) had three to five family members. Regarding monthly income, just 20 (11%) nurses reported earning 90000, while 77 (42.3%) nurses earned between 71000 and 90000. About 10% of respondents were widowed or separated from their spouses, while 131 (72%) of respondents were married,

and 18.1% were single. Additionally, the survey discovered that while 72% of respondents had two children and 4.4% were mothers of three, 23.6% of respondents had no children. Only 18 (9.9%) had more than 20 years of job experience, whereas 76 (41.8%) had served for more than 6 years. While 42% have fewer than 6 years of nursing experience, 33.5% have 6 to 10 years. The remaining experiences ranged from eleven to twenty years.

Table I Socio-demographic characteristics of the respondent nurses (n=182)

Variables	Frequency (n=182)	Percentage (%)
Age		
Less than 25 years	50	27.5
25 to 34 years	71	39.0
35 to 44 years	43	23.6
More than 44 years	18	9.9
Education		
Diploma in Nursing/ Midwifery	43	23.6
Bachelors in Nursing/Post-basic	42	23.1
Masters in Nursing/MPH	97	53.3
Number of Family Members		
Less than 3 persons	36	19.8
3 to 5 persons	146	80.2
Monthly family income		
Less than BDT 51000	42	23.1
BDT 51000 to 70000	43	23.6
BDT 71000 to 90000	77	42.3
More than BDT 90000	20	11.0
Number of Children		
No children	43	23.6
Two children	131	72.0
Three children	8	4.4
Marital Status		
Married	131	72.0
Single	33	18.1
Widowed/Divorced	18	9.9
Job experience in Nursing		
Less than 6 years	76	41.8
6 to 10 years	61	33.5
11 to 15 years	17	9.3
16 to 20 years	10	5.5
More than 20 years	18	9.9

The study found that 69 respondents (38%) had hypertension, while 64 (35%) were diagnosed with diabetes and 118 (65%) were not. Most respondents, 107 (58.8%), had a normal BMI (19–24), but it is concerning that over one-third, 68 (37.4%), were overweight or obese. Only 7 participants (3.8%) were underweight. Additionally, 59 respondents (32.4%)

reported experiencing unnecessary anxiety about routine events. A significant portion, 124 (68.1%), admitted to regularly consuming raw salt in their diet. Encouragingly, nearly 163 participants (90%) reported engaging in at least 30 minutes of physical exercise daily. Regarding family history, almost 90% of respondents indicated that hypertension was prevalent among their family members, while 13% reported no such history. Notably, the majority of respondents' fathers 134 (73.6%) had hypertension, compared to only 24 (13.2%) of their mothers.

Table II Hypertension status and related factors among the respondents (n=182)

Attributes	Frequency (n=182)	Percentage (%)
Hypertension		
Present	69	38.0
Absent	113	62.0
Diabetes		
Present	64	35.0
Absent	118	65.0
BMI Status		
Underweight (<19)	7	3.8
Normal weight (19-24)	107	58.8
Overweight (>25)	68	37.4
Unnecessary anxiety		
Yes	59	32.4
No	123	67.6
Raw salt consumption		
Yes	124	68.1
No	58	31.9
Daily exercise (30 minutes)		
Yes	163	89.6
No	19	10.4
Family History of Hypertension		
Absent	24	13.2
Father	134	73.6
Mother	24	13.2

Over 96 respondents (52.7%) reported using social media for more than 3–4 hours daily. Television viewing was also common, with 102 respondents (56%) watching it for more than an hour each day, while 54 (29.7%) showed no interest in TV content. Social interactions appeared limited - only 32 respondents (17.6%) spent about 30 minutes daily with neighbors or relatives, 73 (40.1%) socialized three times a week, and around 50 (27.5%) did not engage socially at all, mainly due to work-related stress from home and hospital duties. A majority of the respondents, 113 (62.1%), shared cooking responsibilities with their partners. Moreover, 71 respondents (39%) were primarily responsible for childcare.

Table III Snapshots on lifestyle of nurses (n= 182)

Tasks □ □	Frequency □ (n=182) □	Percentage (%)
Social Media time □		
Less than 1 hour □	16 □	8.8
1 to 2 hours □	60 □	33.0
3 to 4 hours □	96 □	52.7
More than 4 hours □	10 □	5.5
Television watch □		
Do not watch TV □	54 □	29.7
Less than 1 hour □	10 □	5.5
1 to 2 hours □	102 □	56.0
More than 2 hours □	16 □	8.8
Socialization □		
Every day □	32 □	17.6
Thrice a week □	73 □	40.1
Once a week □	27 □	14.8
Not in every week □	50 □	27.5
Cooking task □		
Solely me □	61 □	33.5
Me with help of my partner □	113 □	62.1
Me with help of other family member □	8 □	4.4
Child care □		
Don't have children □	43 □	23.6
Solely me □	71 □	39.0
Me with help of my partner □	16 □	8.8
Me with help of child's House tutor □	52 □	28.6

According to study findings on the level of knowledge about Hypertension among the respondents using the Hypertension Knowledge Level Scale (HKLS), there were about 77(42%) nurses with high knowledge on Hypertension, 51(28%) had moderate knowledge, and lastly 54 (30%) of them had no knowledge on Hypertension.

Table IV Level of knowledge on hypertension among the respondents (n=182)

Level of Knowledge □	Frequency □	Percentage (%)
High knowledge □	77 □	42.0
Low knowledge □	54 □	30.0
Moderate knowledge □	51 □	28.0

The study found that the level of knowledge on hypertension is strongly associated with socio-demographic status (Table IV). It is found correlated with Age ($p<0.0001$), Education ($p<0.0001$), marital status ($p<0.0001$), and Years of Nursing experience in Hospitals ($p<0.0001$). However, there is no significance found with the number of children ($p<0.629$).

Table V Association of Socio-demographic status with level of knowledge on Hypertension

Variables □ □	Level of HTN Knowledge (n=182) □ □ □			Frequency □ (n=182) □	Percentage □ (%) □	Fisher's □ p chi-square value
	Low □ (54) □	Moderate □ (51) □	High □ (77) □			
Age □						27.31 □ 0.000
Less than 25 years □	23 □	3 □	24 □	50 □	27.5 □	
25 to 34 years □	20 □	22 □	29 □	71 □	39.0 □	
35 to 44 years □	11 □	15 □	17 □	43 □	23.6 □	
More than 44 years □	0 □	11 □	7 □	18 □	9.9 □	
Education □						80.34 □ 0.000
Diploma in Nursing/ Midwifery □	33 □	3 □	7 □	43 □	23.6 □	
Bachelors in Nursing/Post-basic □	5 □	25 □	12 □	42 □	23.1 □	
Masters in Nursing/MPH □	16 □	23 □	58 □	97 □	53.3 □	
Marital Status □						37.10 □ 0.000
Single □	23 □	3 □	7 □	33 □	18.1 □	
Married □	23 □	45 □	63 □	131 □	72.0 □	
Separated/Widowed □	8 □	3 □	7 □	18 □	9.9 □	
Job experience in Nursing □						66.64 □ 0.000
Less experience □	33 □	3 □	40 □	76 □	41.8 □	
Some experience □	10 □	30 □	21 □	61 □	33.5 □	
Good experience □	8 □	0 □	9 □	17 □	9.3 □	
Better experience □	3 □	7 □	0 □	10 □	5.5 □	
Best experience □	0 □	11 □	7 □	18 □	9.9 □	

Among the respondents, over 62% were with Hypertension and 65.4% with Diabetes. It is found that the level of knowledge on hypertension is strongly significant with the presence of Hypertension ($p<0.001$), Family history of Hypertension ($p=0.006$), presence of Diabetes ($p<0.001$), and respondent's BMI ($p<0.001$).

Table VI Association of health issues with the level of knowledge on Hypertension

Variables □ □	Level of HTN Knowledge □ □ □			Frequency □ (n=182) □	Percentage □ (%) □	Fisher's □ p chi-square value
	Low □	Moderate □	High □			
Hypertension □						61.92 □ 0.000
Yes □	44 □	10 □	15 □	69 □	37.9 □	
No □	10 □	41 □	62 □	113 □	62.1 □	
Family history of HTN □						24.44 □ 0.006
Absent □	14 □	3 □	7 □	24 □	13.2 □	
Father □	32 □	48 □	54 □	134 □	73.6 □	
Mother □	8 □	0 □	16 □	24 □	13.2 □	
Diabetes □						29.10 □ 0.000
Yes □	5 □	16 □	42 □	63 □	34.6 □	
No □	49 □	35 □	35 □	119 □	65.4 □	
Body Mass Index (BMI) □						66.98 □ 0.000
Underweight (<19.0) □	0 □	0 □	7 □	7 □	3.8 □	
Normal weight (19.1 to 24.9) □	12 □	33 □	62 □	107 □	58.8 □	
Overweight (more than 25.0) □	42 □	18 □	8 □	68 □	37.4 □	

Discussion

Hypertension is one of the major causes for generating many diseases. Knowledge about hypertension can prevent it in many ways. The current study participants were female nurses from a tertiary level hospital, among whom three quarter (76.5%) of the respondents were below 34 years' age and the mean age 33.5 ± 8.24 years. Several study portraits that hypertension affects 22 percent of the world's adult population. Among them more than 80% of hypertension cases are currently seen in low- and middle-income nations, with differences between countries, gender, age and socioeconomic groups²⁰.

Over half of the respondents (53.3%) had completed their Master degree either Masters in Nursing or Master of Public Health (MPH) and other half were almost equally distributed among who completed Bachelor in Nursing (23.1%) and Diploma in Nursing (23.6%). Majority (80.2%) respondents were belonged to a family with 3 to 5 members. As working nursing professional all the respondents found with family income more than BDT. 40,000 per month. Around 72% respondents were married and same percentage of them have at least two children. Majority, 75% of the nurses were experienced less than 10 years in their job, whereas about 42% had less than 6 years and 33.5% had experienced of 6 to 10 years in nursing. On the other hand, about 10% of respondents with more than 20 years of experiences also participated in the study. A study in Brazil revealed a prevalence of hypertension on 26.0 percent among hospital employees, while another study in Brazil found a prevalence of 36.0 percent only among female nursing staff, only 8.6% of hospital personnel in Iran had hypertension, with up to 37% of them being pre-hypertensive.²¹⁻²³

According to the researches, prevalence of probable Common Mental Disorders (CMD) rates among physicians and female nurses were 26% and 36% respectively. The current study revealed that more than 62% participants were with hypertension though they had got the disease within last two years and the study also found that near about 87% of their family member had a history of hypertension.^{21,22} Majority of respondents reported that their father (73.6%) was affected by hypertension and few of their mothers (13.2%) had it. Hypertension is one of the most prevalent comorbidities in people with diabetes and has a significant impact on morbidity and death.²⁴ In this study, 65.4% respondents were found diabetic, while remains 34.6% did not have diabetes. Weight is significant for hypertensive patients with a BMI of more than 25, as it helps to lower blood pressure. The present study found that the majority, (58.8%) of the

respondents were of normal weight in measurement of Body Mass Index (BMI) however, alarming is that more than one third respondents found (37.4%) with overweight or obese.

According to the study findings, it is found that the level of knowledge on hypertension among the respondents were about 42% nurses with high knowledge on hypertension, 28% had moderate knowledge and 30% of them lacked knowledge on hypertension. In terms of demographic data, such as gender, age, skin color, education, and family income, the prevalence of hypertension followed the same patterns as previously known for hypertension: it is higher in men, older age groups, non-white individuals, and those with a lower education and low family income. This study found that the level of knowledge on hypertension is strongly associated with socio-demographic status. It is found correlated with age ($p < 0.0001$), education ($p < 0.0001$), number of family members ($p < 0.0001$), per month family income ($p < 0.0001$), marital status ($p < 0.0001$) and years of nursing experience in Hospitals ($p < 0.0001$). Several studies have found that lifestyle factors such as physical exercise and nutrition are crucial in managing hypertension and reducing long-term consequences. The present study also found that 30 minutes' exercise ($p < 0.001$), cooking main foods at home, duration on social media ($p < 0.001$), and duration of television watching ($p < 0.001$) is strongly associated with level of knowledge on hypertension. However, consumption of raw salt with food ($p < 0.020$), anxiety on regular life events ($p < 0.014$), looking after children's academic issues ($p < 0.011$) and frequency of socializing with neighbor or relatives ($p < 0.015$) are mildly associated with knowledge level on hypertension among nursing professionals. The intake of excessive levels of dietary salt (NaCl) on a daily basis has been linked to increases in blood pressure in observational studies all over the world.²⁵

Hypertension was found to be prevalent among relatives of senior nursing professionals at the Sylhet medical college, with 12 percent reporting a history of hypertension in their mothers, 7.3 percent reporting a history of hypertension in their fathers, Sisters 3.3 percent, Brothers 2.7 percent, and uncles.¹⁶ Among the respondents of this study over 62% were with Hypertension and 65.4% with diabetes. It is found that level of knowledge on hypertension is strongly significant with presence of hypertension ($p < 0.001$), Family history of Hypertension ($p < 0.006$), presence of Diabetes ($p < 0.001$) and respondent's BMI ($p < 0.001$). There is some limitation of this study. The cross-sectional design of this study makes it hard to draw

causal conclusions. The survey's nature, which relied only on self-reported data, allowed for a broad assessment of health practices and self-rated health. As a result, the findings could have limited clinical significance.

Conclusion

This study revealed that one-third of nurse participants lack knowledge about hypertension, linked to socio-demographic factors and lifestyle factors. Some factors like age, education, family size, income, marital status, and nursing job experience also contribute to this knowledge gap. Hypertension knowledge is linked to hypertension presence, family history, diabetes, and BMI. Enhancing knowledge through structured educational programs can improve patient care and hypertension control. Further research with a larger sample size is recommended to understand healthcare personnel's knowledge levels and lifestyle characteristics, enabling more effective interventions for hypertension awareness and management.

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Disclosure

The authors declare no conflict of interest.

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