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Assessment of Knowledge Regarding Hypertension Among Nursing and Allied Health Sciences Students at Khyber Medical University

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Abstract

Hypertension is a major modifiable risk factor for cardiovascular disease and is frequently described as a 'silent killer' due to its largely asymptomatic course. Adequate knowledge of its risk factors, complications, and management is essential for healthcare students who will later be responsible for patient screening, counselling, and care. This study aimed to assess the baseline knowledge of hypertension among undergraduate nursing and allied health sciences students at Khyber Medical University (KMU), Peshawar. A descriptive cross-sectional study was conducted at the Institute of Nursing Sciences and the Institute of Allied Health Sciences, KMU, over a period of three months. A sample of 306 students was calculated using the WHO sample size formula and selected through proportional stratified random sampling across the two departments. Data were collected using a structured, self-administered questionnaire covering socio-demographic characteristics, a 12-item hypertension knowledge scale, and sources of health information, and were analyzed using SPSS version 22. Of 306

students approached, 305 completed the questionnaire, giving a response rate of 99.7%. Nursing students comprised 24.9% and Allied Health Sciences students 75.1% of the sample; 67.2% of participants were male and 32.8% were female. The mean knowledge score was 8.44 ± 1.65 out of 12. Good knowledge was observed in 56.7% of participants, moderate knowledge in 38.7%, and poor knowledge in 4.6%. University teachers and faculty (51.1%) were the leading source of hypertension-related information, followed by doctors and senior nurses (23.9%). Undergraduate nursing and allied health sciences students at KMU demonstrated an overall satisfactory level of hypertension knowledge; however, a considerable proportion showed only moderate understanding, indicating a need for curriculum reinforcement and structured clinical training to prepare them for effective patient counselling.

Keywords: Hypertension; Knowledge; Nursing Students; Allied Health Sciences; Cross-Sectional Study; Pakistan

INTRODUCTION:

Hypertension (HTN) is a chronic medical condition characterized by persistently elevated systemic arterial blood pressure and is a leading global contributor to cardiovascular morbidity and mortality. It is widely described as a 'silent killer' because affected individuals typically remain asymptomatic until significant target-organ damage or an acute cardiovascular event occurs. Clinical guidelines generally define hypertension as a sustained systolic blood pressure (SBP) ⩾140 mmHg and/or diastolic blood pressure (DBP) ⩾90 mmHg. Hypertension continues to affect a substantial proportion of young adults; a recent South Indian cohort study reported considerable rates of prehypertension and undiagnosed hypertension among individuals aged 20–39 years, underscoring that the disease is no longer confined to older populations (1).

The etiology of hypertension involves a complex interplay of modifiable and non-modifiable risk factors. Modifiable factors include excessive dietary sodium intake, insufficient physical activity, high intake of saturated fats, tobacco smoking, chronic alcohol consumption, obesity, and prolonged psychological stress, while non-modifiable factors include advancing age, family history of cardiovascular disease, genetic predisposition, and comorbidities such as diabetes mellitus and chronic kidney disease.

The introduction of the term 'prehypertension' by the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) emphasized the clinical significance of early borderline blood pressure

elevation (SBP 120–139 mmHg or DBP 80–89 mmHg), a stage associated with accelerated progression to overt hypertension and a heightened lifetime risk of major adverse cardiovascular events.

In Pakistan, poor public awareness of hypertension and its complications has been consistently linked to delayed health-seeking behavior and poor blood pressure control. Huma et al. reported that a large proportion of non-hypertensive adults in Pakistani cohorts lacked adequate baseline awareness of hypertension and its complications, identifying formal education as the strongest predictor of health literacy (2). Similarly, Niaz et al. found that more than half of an adult screening cohort at a teaching institute in Khyber Pakhtunkhwa met the criteria for prehypertension, with significantly higher pressures recorded among male participants (3). Healthcare personnel themselves are not exempt from this vulnerability: Alam et al. reported a substantial burden of previously undiagnosed hypertension among clinical staff at Khyber Teaching Hospital, Peshawar, attributing it to occupational stress, irregular sleep, and physical inactivity (4).

Evidence regarding the academic preparedness of health professional students also reveals notable gaps. Shaikh et al., in an evaluation of entry-year medical and health sciences students, found that despite selective enrolment in professional programs, baseline knowledge of cardiovascular risk factors remained incomplete (5). Rathod et al. and Alhazmi et al. similarly highlighted sociodemographic variation in hypertension awareness among students, reinforcing the value of structured, scale-based assessment tools such as the Hypertension Knowledge-Level Scale (HK-LS) for standardizing the measurement of educational outcomes (6,7). Comparable knowledge gaps have also been documented among school and college populations; Chaudhari et al. reported incomplete understanding of non-communicable disease risk factors among higher secondary students, indicating that knowledge deficits regarding chronic disease begin early in the educational pipeline (8).

Knowledge deficits are not restricted to students or the general public; even patients already diagnosed with hypertension often demonstrate limited understanding of their condition. Kisokanth et al. and Oliveria et al. both reported suboptimal knowledge of hypertension, its consequences, and its management among hypertensive

patients, which has direct implications for treatment adherence and blood pressure control (9,10). Pharmacists and other allied health professionals have been identified as an important, and sometimes underutilized, resource in closing this knowledge gap; Ragot et al. demonstrated that structured pharmacist involvement was associated with improved patient understanding of hypertension and its management (11).

Because nursing and allied health sciences students will become the frontline healthcare workforce responsible for community screening, patient counselling, and chronic disease management, their own knowledge of hypertension carries direct implications for future patient outcomes. Despite this, data specific to the knowledge levels of nursing and allied health sciences students in Khyber Pakhtunkhwa remain scarce. This study was therefore designed to assess the baseline knowledge of hypertension — including its definition, risk factors, complications, and management — among undergraduate nursing and allied health sciences students at Khyber Medical University, Peshawar, and to identify the primary sources through which this knowledge is acquired.

MATERIAL AND METHODS:

This descriptive cross-sectional study was conducted at the Institute of Nursing Sciences and the Institute of Allied Health Sciences, Khyber Medical University (KMU), Peshawar, Pakistan. These institutes were selected owing to their diverse undergraduate nursing and allied health sciences programs and their status as leading health professional training institutes in the region. The study was conducted over a period of three months, from January 2026 to April 2026.

The target population comprised all actively enrolled undergraduate students of the two institutes, representing an aggregate frame of approximately 1,480 students. The sample size was calculated using the World Health Organization (WHO) sample size estimation formula, $N = Z^2 \times P \times (1 - P)/E^2$, where N represents the sample size, P the assumed prevalence (taken as 50% in the absence of local baseline data), Z the value for a 95% confidence interval (1.96), and E the margin of error (5%). This yielded a required sample of 306 students. A stratified random sampling technique was applied to ensure proportional representation from the two departments; the sample was allocated in an approximate 1:3 ratio, yielding 76 students from Nursing and 230 from Allied Health

Sciences, with gender distribution within each stratum reflecting the typical enrolment pattern of the respective department (38 males and 38 females in Nursing; 172 males and 58 females in Allied Health Sciences).

Undergraduate nursing and allied health sciences students currently enrolled in the 3rd, 4th, 6th, 7th, or 8th semester, aged 18–30 years, and willing to provide written informed consent were included in the study. Students enrolled in post-RN or in-service professional programs, individuals absent during multiple consecutive data collection visits, and those declining participation were excluded.

Ethical approval for this study was obtained from the Institutional Ethical Review Committee of Khyber Medical University prior to the commencement of data collection. Written informed consent was obtained from all participants after explaining the purpose, procedure, and voluntary nature of the study, and the confidentiality of participant information was maintained throughout the study.

Data were collected using a validated, structured, self-administered questionnaire consisting of three sections: (1) participant socio-demographic characteristics, (2) a 12-item objective Hypertension Knowledge Evaluation Scale covering the definition, risk factors, complications, and management of hypertension, and (3) the primary sources through which participants obtained health-related information. Questionnaires were distributed to eligible students during class hours after a brief explanation of the study purpose, and completed forms were checked for completeness before collection.

Data were cleaned, coded, and analyzed using the Statistical Package for Social Sciences (SPSS), version 22. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize socio-demographic characteristics and knowledge scores. Based on the number of correct responses, knowledge was categorized as Poor (0–4 correct responses, <50%), Moderate (5–8 correct responses, 50–70%), or Good (9–12 correct responses, >70%).

RESULTS:

Out of 306 students invited to participate, 305 completed and returned usable questionnaires, representing a response rate of 99.7%. Of the respondents, 76 (24.9%) were enrolled in the Nursing department, while 229 (75.1%) were enrolled in Allied Health Sciences. The majority of participants (94.1%, n = 287) were between 18 and 25

years of age. Males constituted 67.2% (n = 205) of the sample, while females accounted for 32.8% (n = 100) (Table 1). The distribution of participants across academic semesters is presented in Table 2, with the highest representation from the 6th semester (37.7%) and the 8th semester (25.6%).

Table 1: *Demographic Distribution of Participants (n = 305)*

Variable	Category	Frequency (n)	Percentage (%)
Department	Nursing	76	24.9%
	Allied Health Sciences (AHS)	229	75.1%
Age Cohort	18 to 25 Years	287	94.1%
	25 to 29 Years	18	5.9%
Gender	Male	205	67.2%
	Female	100	32.8%

Table 2: *Distribution of Participants by Academic Semester (n = 305)*

Academic Semester	Frequency (n)	Percentage (%)
2nd Semester	4	1.3%
3rd Semester	20	6.6%
4th Semester	18	5.9%
5th Semester	66	21.6%
6th Semester	115	37.7%
7th Semester	4	1.3%
8th Semester	78	25.6%
Total	**305**	**100.0%**

The structured objective evaluation yielded a mean aggregate knowledge score of 8.44 ± 1.65 out of a maximum possible score of 12. Overall, 173 students (56.7%) achieved scores placing them in the 'Good Knowledge' category, 118 participants (38.7%)

demonstrated 'Moderate Knowledge', and 14 students (4.6%) fell into the 'Poor Knowledge' category (Table 3).

Table 3: *Categorized Hypertension Knowledge Scores (n = 305)*

Knowledge Level (Score Range)	Frequency (n)	Percentage (%)
Poor (0 to 4)	14	4.6%
Moderate (5 to 8)	118	38.7%
Good (9 to 12)	173	56.7%
Total	**305**	**100.0%**

Regarding the primary channels through which students acquired information on hypertension, university teachers and faculty were identified as the leading source, cited by 51.1% (n = 156) of participants. Medical professionals, including doctors and senior nurses, were cited by 23.9% (n = 73). Digital and informal sources contributed comparatively less, with social media accounting for 14.4% (n = 44) and Google/internet articles accounting for 8.5% (n = 26) of responses, while structured health seminars and academic workshops were the least cited source (2.0%, n = 6) (Table 4).

Table 4: *Primary Sources of Hypertension-Related Information (n = 305)*

Information Channel	Frequency (n)	Percentage (%)
University Teachers / Faculty	156	51.1%
Medical Professionals (Doctors/Nurses)	73	23.9%
Social Media Platforms	44	14.4%
Google / Internet Articles	26	8.5%
Health Seminars / Academic Workshops	6	2.0%
Total	**305**	**100.0%**

DISCUSSION:

The present study demonstrates that undergraduate nursing and allied health sciences students at KMU have generally satisfactory baseline knowledge of hypertension, with more than half (56.7%) of participants scoring in the 'Good Knowledge' category. This

finding is consistent with the expectation that students enrolled in structured healthcare curricula, who are regularly exposed to clinical case discussions and supervised rotations, would demonstrate better disease-specific knowledge than the general population. In contrast, community-based surveys conducted in Pakistan, such as that of Huma et al., have consistently reported substantial gaps in baseline hypertension awareness among non-hypertensive adults, reinforcing that healthcare students appear to benefit measurably from their academic environment (2).

Despite this encouraging overall picture, a considerable proportion of participants (38.7%) demonstrated only 'Moderate Knowledge', while a small subset (4.6%) fell into the 'Poor Knowledge' category. This is a clinically relevant finding, as future healthcare providers are expected to possess precise and comprehensive understanding of diagnostic thresholds, risk stratification, and counselling strategies in order to be effective at the point of care. Comparable gaps have been reported among health professional students elsewhere; Shaikh et al. found that entry-year medical and health sciences students demonstrated incomplete baseline knowledge of cardiovascular risk factors despite their selective professional enrolment (5), while Rathod et al. and Alhazmi et al. similarly documented variable levels of hypertension awareness linked to sociodemographic and academic factors (6,7). These parallels suggest that a moderate-knowledge tier is a recurring finding across health-professional student populations and is unlikely to be fully resolved through informal exposure alone. Importantly, knowledge deficits are not limited to students or the general public; even individuals already diagnosed with hypertension often demonstrate limited understanding of their own condition, as reported by Kisokanth et al. and Oliveria et al. (9,10). This reinforces the argument that future healthcare providers, including nursing and allied health sciences graduates, must be equipped with strong baseline knowledge if they are to effectively counsel patients and improve long-term disease control.

The present study also found that university teachers and faculty (51.1%) were the leading source of hypertension-related information for students, followed by doctors and senior nurses (23.9%), while social media (14.4%) and internet searches (8.5%) contributed comparatively less. This finding highlights the central role that structured academic instruction continues to play in shaping health knowledge among

students, and is in line with literature emphasizing that formal, supervised sources of information, including trained health professionals such as pharmacists, are associated with more accurate patient understanding of hypertension compared with informal or digital sources (11).

The comparatively low reliance on digital and social media sources observed in the present study may reflect the effectiveness of the structured curriculum at KMU; however, it also suggests that these channels remain underutilized as supplementary tools for reinforcing classroom learning, an approach that has shown promise in improving chronic disease knowledge among younger populations elsewhere (8).

LIMITATION:

This study has certain limitations that should be considered when interpreting its findings. First, being a single-institution study, the findings may not be generalizable to nursing and allied health sciences students of other institutions in Pakistan. Second, the cross-sectional design captures knowledge at a single point in time, limiting the ability to draw conclusions about changes in knowledge over the course of the academic program. Third, data were collected using a self-administered questionnaire, which may be subject to recall or social desirability bias. Finally, the study assessed factual knowledge only and did not evaluate students' practical skills in blood pressure measurement or patient counselling, which are equally important components of clinical competence.

CONCLUSION:

Undergraduate Nursing and Allied Health Sciences students at Khyber Medical University demonstrated a generally satisfactory baseline knowledge of hypertension, with the majority of students falling in the good-to-moderate knowledge range. However, the considerable proportion of students with only moderate knowledge highlights specific gaps that could affect their future effectiveness in patient counselling, screening, and chronic disease management. Structured curricular reinforcement, combined with regular clinical workshops, is recommended to consolidate hypertension-related knowledge among healthcare students before they enter clinical practice.

RECOMMENDATIONS:

1. Curricular Integration: Mandate advanced, dedicated public health and cardiovascular screening modules within early undergraduate health semesters.
2. Practical Workshops: Organize routine, compulsory seminars focused on standardized blood pressure measurement, patient risk stratification, and behavioral counselling protocols.
3. Campus Health Initiatives: Implement institutional screening and awareness programs to encourage healthy lifestyle behaviors, stress reduction, and dietary management among students.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

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