https://doi.org/10.15218/zjms.2025.069

Knowledge, attitudes, and practices toward hypertension and its risk factors among university employees in Erbil city

Received: 26/03/2025 Accepted: 08/05/2025

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Abstract

Background and objective: Hypertension is a significant public health issue both globally and in Iraq, it plays a major role in cardiovascular morbidity and mortality. Although highly educated, university employees may still be at risk due to sedentary habits, stress, and poor health practices. Assessing their knowledge, attitudes, and practices (KAP) related to hypertension is essential for developing effective prevention and management strategies. This study aimed to evaluate the knowledge, attitudes, and practices concerning hypertension and its risk factors among employees of public universities in Erbil City.

Methods: A cross-sectional descriptive study was carried out among academic and administrative staff at Erbil Polytechnic University, Hawler Medical University. Salahaddin University participants were selected using Stratified random sampling. Data were gathered through a structured questionnaire that included demographic information and assessed knowledge, attitude and practice related to hypertension, The collected data were analyzed using SPSS, employing both descriptive and inferential statistical methods.

Results: The study included 400 participants, aged between 22 and 69 years. The average knowledge score was 44.4%, with 66.5% of participants exhibiting poor knowledge. Attitudes toward hypertension were mostly positive reflected by an average score of 65.63%; nonetheless, 63.7% of participants displayed neutral attitudes. The average practice score was 50.13%, with 50.7% of participants showing poor health practices. Significant associations were observed between knowledge levels and factors such as gender, education, occupation, and income (P <0.05). higher practice scores were associated with older age, higher education, chronic health conditions, and longer years of service.

Conclusion: Despite generally positive attitudes, there is a significant gap in knowledge and health-promoting practices related to hypertension among university employees in Erbil. Targeted educational programs, workplace wellness initiatives, and ongoing health promotion efforts are suggested to enhance knowledge, attitude and practice and lower the risk of hypertension in this population.

Keywords: Hypertension; Health Awareness; Knowledge-Attitude-Practice (KAP); Risk Factors; Preventive Measures; University Employees; Iraq.

Introduction

Hypertension is a worldwide health issue, impacting more than one billion individuals globally and serves as the primary risk factor for cardiovascular disease and the overall burden of disease.[1]

It is the foremost preventable risk factor for death and disability, responsible for 10.7 million deaths and 212 million disability-adjusted life years (DALYs) in 2015. The prevalence of hypertension has risen dramatically, increasing from 594 million adults in 1975 to 1.13 billion in 2015, with the greatest burden now concentrated in low- and middle-income countries.[2] Recent updates to guidelines

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https://doi.org/10.15218/zjms.2025.069

have further elevated the estimated prevalence of hypertension in several countries.[1]

Despite its importance, hypertension is often given low priority due to its chronic and asymptomatic characteristics.[3] tackling this epidemic demands a comprehensive approach, encompassing public awareness, early detection, efficient treatment, and the promotion of healthy lifestyle habits.[4]

A study conducted on university staff in Turkey found that academic personnel demonstrated higher levels of healthy lifestyle behaviors than administrative staff, with nutrition and interpersonal support being the highest-scoring Factors. Additionally, variables such as gender, age, education level, marital status, and job satisfaction were identified as influencing healthy lifestyle behaviors. The authors suggest the implementation of educational programs to target areas where both academic and administrative staff exhibit deficiencies in health-related behaviors.[5]

Hypertension is a widespread health concern in Iraq, with studies indicating high prevalence rates among older adults in Kurdistan, reaching 54.7%[6] and varying degrees of knowledge and practices among patients. While some studies show relatively good knowledge and attitudes towards hypertension, others highlight insufficient understanding and poor practices.[7]

Factors influencing hypertension knowledge include age, gender, education level, and duration of diagnosis.[8] Although some patients demonstrate good awareness of lifestyle factors, there are considerable knowledge gaps, especially concerning the definition of hypertension and its risk factors.[8,9] These findings highlight the necessity for targeted education initiatives and comprehensive health programs to enhance hypertension awareness, prevention, and management in Iraqi populations.[6,9]

Recent research underscores the prevalence and understanding of hypertension and cardiovascular disease risk factors in Iraq. A high prevalence of hypertension (54.7%) was observed among older adults in Erbil, with age, male gender, unemployment, and obesity recognized as major risk factors. Knowledge of hypertension varies, as a study of University of Baghdad employees revealed moderate awareness, though there were gaps in understanding its definition.[10] knowledge levels were correlated with educational level and the duration since diagnosis. In Erbil, 90% of young adults exhibited moderate to high awareness of cardiovascular disease risk factors.[11] However, a study of medical staff indicated low levels of physical activity and sufficient consumption of fruit and vegetables.[12]

Recent studies have explored knowledge, attitudes, and practices (KAP) related to hypertension across different populations. A study in Lucknow, India, revealed limited awareness and practices, with only 30% of participants having their blood pressure checked.[13] Similarly, research at the University of Baghdad identified knowledge gaps among hypertensive employees, especially in defining hypertension, with educational level and time since diagnosis playing a significant role in shaping awareness;[14] In contrast, a study at the University of Namibia's Faculty of Health Sciences revealed higher levels of knowledge, with 85% of participants aware of hypertension risk factors. However, only 39% consistently monitored their blood pressure, and slightly more than 50% practiced heart-healthy behaviors.[15]

This study aims to evaluate the knowledge, attitudes, and practices of university staff in Erbil concerning hypertension and its associated risk factors, with the goal of identifying deficiencies and improving strategies for prevention and management.

Methods

Study design: This study employed a cross-sectional survey design to evaluate the knowledge, attitudes, and practices

https://doi.org/10.15218/zjms.2025.069

(KAP) of university staff in Erbil regarding hypertension and its associated risk factors.

Study Setting and Population: The study was conducted among employees from three prominent universities in Erbil: Salahaddin University, Hawler Medical University, and Hawler Polytechnic University. The target population consists of both academic and administrative staff at these institutions.

Sample Size and Sampling Method: A total of 400 participants were recruited for the study representing a diverse group of university employees aged between 22 and 69 years, with an average age of 41.54 years. Participants were selected through a random sampling method to ensure broad representation.

The target population for this study comprised approximately 8,000 employees working across three universities. A cluster sampling technique was initially employed by categorizing the population into three distinct clusters based on their respective universities. Within each cluster, convenience sampling was utilized to select respondents who were readily accessible and willing to participate in the study. This approach was chosen due to practical considerations such as time constraints and ease of access to participants. To determine the appropriate sample size, an Epi Info version 7 was used to calculate the estimated sample size, using a 95% confidence level and a 5% margin of error. Assuming an expected frequency of 50%, which provides the maximum required sample size for a given level of precision, the calculated minimum sample size was. However, we chose 400 participants to overcome non-respondents. This calculation accounted for the finite population size of 8,000, ensuring that the sample would be both statistically adequate and representative of the broader employee population across the selected universities

Data Collection Tool: Data were gathered using a structured questionnaire, developed regarding existing literature and validated instruments commonly employed in knowledge, attitude and practice (KAP) studies on hypertension. The questionnaire encompassed four main areas: Demographic Information, including age, gender, education level, occupation, income, etc. Knowledge Assessment included questions on the definition of hypertension, its causes, symptoms, risk factors, and preventive measures**,** Attitude Assessment focused on perceptions regarding the seriousness of hypertension, individual susceptibility to it, and the importance of preventive actions**,** Practice Assessment focused on behaviors related to the management of hypertension, including dietary habits, physical activity, and regular blood pressure monitoring

For the validity of the questionnaire, we sent it to five experts in the field. A pilot study done by sending the questionnaire to 30 employees revealed that the questions were clear and understandable. Those 30 employees were excluded from the real study.

Distributed five hundred questionnaires, and we received more than 400, including missing information, so incomplete questionnaires were excluded, leaving only 400. According to Epi Info, we needed 367 people; we excluded the missing values and put 0 and didn't have to put it.

Data Collection Procedure: The survey was carried out using self-administered questionnaires, which were distributed during working hours to maintain privacy and confidentiality. Participation was voluntary, and informed consent was obtained from all participants before data collection.

Data were analyzed using both descriptive and inferential statistical methods. SPSS software was utilized for data entry and analysis. Descriptive statistics, including means, percentages, and standard deviations, were used to analyze demographic data and KAP scores. Inferential statistics, such as the Chi-square test, were employed to examine

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the relationship between KAP levels and demographic variables like gender, age, education level, occupation, income, and years of service. A *P*-value <0.05 was considered statistically significant.

This research evaluated the knowledge, attitudes, and practices (KAP) concerning hypertension among university staff through the use of a standardized, structured questionnaire. Participant responses were quantified and expressed as percentage scores across each domain of knowledge, attitudes and practices. The percentage Scores were classified into three categories: poor (below 50%), average (50–74%), and good (75% or above) to facilitate stratification of participants' level of understanding, attitude, and health-related behaviors. This method of percentage-based categorization, aligned with standard practice in KAP research, serves to identify deficiencies in knowledge and shortcomings in health-related behavior. This structured approach enables the development of focused interventions aimed at addressing the specific gap identified in hypertension awareness and management.

Ethical Considerations: Ethical approval was secured from the appropriate institutional review boards. Participants' privacy and confidentiality were rigorously protected. All data collected were used exclusively for research purposes.

Results

Demographic

The study sample predominantly consisted of female participants (57.3%) ranging in age from 22 to 69 years (M = 41.54), with the majority falling within the 40–49-year age group. The majority of participants held a Bachelor's degree (44.5%), were married (78%), and occupied an administrative position (71%). More than half of the participants had monthly income ranging from 500,000 to 1,000,000 IQD. Participants were primarily associated with Salahaddin University, Hawler Medical University, and Hawler Polytechnic Universities. The majority had more than ten years of work experience (76.8%).

Knowledge, attitudes and practices assessment score:

The study demonstrated a moderate level of knowledge (44.4%), predominantly positive attitudes (65.63%), and moderately practiced behaviors (50.13%) concerning hypertension. Despite favorable apperceptions, a distinct gap was observed between knowledge and its practical application, especially in the adoption of preventive measures such as regular blood pressure monitoring and healthy lifestyle practice. (Table 1)

Table 1 Distribution of KAP assessment score

Variables	Minimum	Maximum	Mean	Std. Deviation
Knowledge score percentage	4	100	44.4	19.571
Attitude Percentage Score	22	100	65.63	14.04
Practice Percentage Score	15.8	100	50.13	16.2

https://doi.org/10.15218/zjms.2025.069

KAP Categories Analysis: The analysis indicated the majority of participants exhibited poor knowledge (66.5%) and insufficient health practices (50.7%) regarding hypertension. although attitudes were predominantly neutral (63.7%), only a small proportion (5.3%) engaged in effective preventive practices. These findings emphasize a substantial gap between knowledge, attitudes, and practical application, highlighting the urgent need for enhanced education and intervention. (Table 2)

Association Between Knowledge Score Categories and Demographic Variables: Hypertension knowledge was significantly associated with gender, education attainment, occupation, and income level, males, individuals with higher education, particularly PhD holders, academics, and participants with higher incomes demonstrated greater knowledge. Other factors, including age, marital status, family history of hypertension, presence of chronic conditions, university affiliation, and years of service, showed no significant influence. (Table 3)

Table 2 Distribution of KAP categories

Variables		No.	%
Knowledge Score Categories	Poor	266	66.5
	Average	94	23.5
	Good	40	10
Attitude Score Categories	Poor	40	10
	Average	255	63.7
	Good	105	26.3
Practice score categories	Poor	203	50.7
	Average	176	44
	Good	21	5.3

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Table 3 Distribution of Knowledge Score Categories

Variables		Poor		Average		Good		
		No.	%	No.	%	No.	%	*P*-value
1-age group	22-29	21	7.9	10	10.6	2	5	0.135
	30-39	87	32.7	43	45.7	10	25	
	40-49	98	36.8	29	30.9	19	47.5	
	50-59	47	17.7	11	11.7	7	17.5	
	60-69	13	4.9	1	1.1	2	5	
2-Gender	Male	109	41	34	36.2	28	70	0.001
	Female	157	59	60	63.8	12	30	
3-Education Level	High School	48	18	5	5.3	2	5	0.0001
	Diploma	60	22.6	18	19.1	6	15	
	Bachelor	124	46.6	43	45.7	11	27.5	
	Master	24	9	17	18.1	8	20	
	PhD	10	3.8	11	11.7	13	32.5	
4-Marital Status	Single	55	20.7	20	21.3	7	17.5	0.331
	Married	206	77.4	74	78.7	32	80	
	Divorced	0	0	0	0	1	2.5	
	Widowed	5	1.9	0	0	0	0	
5-Occupation	Administrative Staff	208	78.2	59	62.8	17	42.5	0.0001
	Academics Staff	58	21.8	35	37.2	23	57.5	
6-Monthly Income	Less Than 500,000 IQD	18	6.8	3	3.2	0	0	0.001
	500,000 – 1,000,000 IQD	148	55.6	45	47.9	11	27.5	
	More Than 1,000,000 IQD	100	37.6	46	48.9	29	72.5	
9-university	Hawler Medical University	74	27.8	28	29.8	17	42.5	0.127
	Salahaddin University	124	46.6	36	38.3	11	27.5	
	Hawler Polytechnic University	68	25.6	30	31.9	12	30	
10-Years of Service	Less Than 1-Year	8	3	4	4.3	2	5.0	0.507
	1-3 Years	22	8.3	9	9.6	0	0	
	4-6 Years	10	3.8	4	4.3	1	2.5	
	7-10 Years	20	7.5	10	10.6	3	7.5	
	More Than 10 Years	206	77.4	67	71.3	34	85	

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Association between attitude score categories with demographic characteristics:
The analysis revealed no significant association between attitudes toward hypertension and the majority of demographic variables. However, university affiliation demonstrated a significant association, with participants from Hawler Medical University exhibiting the highest proportion of positive attitudes (41%), followed by those from Salahaddin University (35.2%) and Hawler Polytechnic University (23.8%). (Table 4)

Table 4 Distribution of Association between attitude score categories with demographic characteristics

Variables		Attitude Score Categories						
		Poor		Average		Good		
		Frequency	%	Frequency	%	Frequency	%	*P*-value
1-age group	22-29	1	2.5	24	9.4	8	7.6	0.395
	30-39	15	37.5	83	32.5	42	40.0	
	40-49	16	40.0	92	36.1	38	36.2	
	50-59	5	12.5	48	18.8	12	11.4	
	60-69	3	7.5	8	3.1	5	4.8	
2-Gender	Male	16	40.0	108	42.4	47	44.8	0.855
	Female	24	60.0	147	57.6	58	55.2	
3-Education Level	High School	5	12.5	31	12.2	19	18.1	0.190
	Diploma	11	27.5	53	20.8	20	19.0	
	Bachelor	21	52.5	119	46.7	38	36.2	
	Master	2	5.0	32	12.5	15	14.3	
	PhD	1	2.5	20	7.8	13	12.4	
4-Marital Status	Single	5	12.5	56	22.0	21	20.0	0.149
	Married	33	82.5	197	77.3	82	78.1	
	Divorced	0	0.0	0	0.0	1	1.0	
	Widowed	2	5.0	2	0.8	1	1.0	
5-Occupation	Administrative Staff	31	77.5	181	71.0	72	68.6	0.571
	Academics Staff	9	22.5	74	29.0	33	31.4	
6-Monthly Income	Less Than 500,000 IQD	0	0.0	16	6.3	5	4.8	0.303
	500,000 – 1,000,000 IQD	26	65.0	126	49.4	52	49.5	
	More Than 1,000,000 IQD	14	35.0	113	44.3	48	45.7	
9-university	Hawler Medical University	9	22.5	67	26.3	43	41.0	0.002
	Salahaddin University	26	65.0	108	42.4	37	35.2	
	Hawler Polytechnic University	5	12.5	80	31.4	25	23.8	
10 Years of Service	Less Than 1-Year	0	0.0	11	4.3	3	2.9	0.484
	1-3 Years	5	12.5	20	7.8	6	5.7	
	4-6 Years	0	0.0	11	4.3	4	3.8	
	7-10 Years	6	15.0	20	7.8	7	6.7	
	More Than 10 Years	29	72.5	193	75.7	85	81.0	

https://doi.org/10.15218/zjms.2025.069

Association between practice score categories with demographic characteristics:
Practice scores were notably higher among older participants (aged 50–69 years), individuals holding PhDs, those with chronic health conditions, and those with more than ten years of experience. These factors were associated with improved health practices in managing hypertension.

Table 5 Distribution of Association between practice score categories with demographic characteristics

Variables		Practice score categories						
		Poor		Average		Good		*P*-value
		No.	%	No.	%	No.	%	
1-age group	22-29	24	11.8	9	5.1	0	0.0	0.0001
	30-39	81	39.9	55	31.3	4	19.0	
	40-49	67	33.0	74	42.0	5	23.8	
	50-59	25	12.3	32	18.2	8	38.1	
	60-69	6	3.0	6	3.4	4	19.0	
2-Gender	Male	90	44.3	70	39.8	11	52.4	0.44
	Female	113	55.7	106	60.2	10	47.6	
3-Education Level	High School	22	10.8	28	15.9	5	23.8	0.004
	Diploma	42	20.7	40	22.7	2	9.5	
	Bachelor	103	50.7	69	39.2	6	28.6	
	Master	26	12.8	21	11.9	2	9.5	
	PhD	10	4.9	18	10.2	6	28.6	
4- Marital Status	Single	42	20.7	34	19.3	6	28.6	0.812
	Married	158	77.8	139	79.0	15	71.4	
	Divorced	0	0.0	1	0.6	0	0.0	
	Widowed	3	1.5	2	1.1	0	0.0	
5-Occupation	Administrative Staff	148	72.9	124	70.5	12	57.1	0.310
	Academics Staff	55	27.1	52	29.5	9	42.9	
6-Monthly Income	Less Than 500,000 IQD	14	6.9	6	3.4	1	4.8	0.386
	500,000 – 1,000,000 IQD	103	50.7	93	52.8	8	38.1	
	More Than 1,000,000 IQD	86	42.4	77	43.8	12	57.1	
9-university	Hawler Medical University	53	26.1	59	33.5	7	33.3	0.145
	Salahaddin University	83	40.9	78	44.3	10	47.6	
	Hawler Polytechnic University	67	33.0	39	22.2	4	19.0	
10-Years of Service	Less Than 1-Year	7	3.4	7	4.0	0	0.0	0.025
	1-3 Years	20	9.9	9	5.1	2	9.5	
	4-6 Years	12	5.9	3	1.7	0	0.0	
	7-10 Years	23	11.3	8	4.5	2	9.5	
	More Than 10 Years	141	69.5	149	84.7	17	81.0	

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Discussion

Knowledge: This refers to the participants' awareness and understanding of hypertension, including its causes, symptoms, complications, and prevention strategies. It was assessed through a series of questions aimed at gauging their cognitive grasp of hypertension-related information.

Attitudes: This encompasses the participants' beliefs, perceptions, and opinions regarding hypertension. It involves their evaluation of the seriousness of the condition, their confidence in managing it, their willingness to make lifestyle changes, and their views on preventive measures and the role of healthcare professionals and the university in addressing hypertension.

Practices: This relates to the participants' actual behaviors and actions concerning hypertension management and prevention. It includes their engagement in blood pressure monitoring, exercise, dietary habits, stress management, and adherence to specific health recommendations.

The demographic characteristics of the study population demonstrate a wide distribution across age, gender, and education levels. Participants ranged in age from 22 to 69, with a mean age of 41.54 years (SD = 8.952), highlighting a notable representation of individuals in their middle adult years. The gender distribution showed a higher proportion of female participants (57.3%) compared to male participants (42.8%). Educational attainment varied, with the majority of participants holding a Bachelor's degree (44.5%), followed by those with a Diploma (21%), High School education (13.8%), Master's degree (12.3%), and the smallest proportion holding a PhD (8.5%).

The study included a diverse group of participants, with ages ranging from 22 to 69 years and a mean age of 41.54 years. The largest group of participants was aged 40-49 years (36.5%), followed by those 30-39 years (35%), and the smallest group was 60-69 years (4%). 57.3% of the participants were female, and 42.8% were male. The participants also had varying educational backgrounds, with the majority holding a Bachelor's degree (44.5%), followed by those with a Diploma (21%), High School education (13.8%), a Master's degree (12.3%), and a PhD (8.5%).

Recent studies on hypertension-related knowledge, attitudes, and practices indicate moderate levels of awareness and adherence to recommended management strategies among patients. Knowledge scores varied from poor to fair (44.4% to 61%), with significant differences observed in participants' understanding of hypertension-related complications.[16] Attitudes towards hypertension management were largely positive, with scores ranging between 64% and 65.63%.[17] Practices varied, with 42.75% to 60% of patients engaging in healthy behaviors related to hypertension management.[17] Despite generally positive attitudes, a noticeable discrepancy persisted between knowledge and its practical implementation, particularly in regular blood pressure monitoring and the adoption of lifestyle modifications.[18] Socioeconomic factors, such as poverty, were recognized as barriers to the adoption of healthy practices. These findings underscore the importance of targeted educational interventions and strengthened health promotion efforts to improve hypertension management and reduce related complications.[18,19]

Several studies have highlighted considerable gaps in knowledge, attitudes, and practices related to hypertension among different populations. A study conducted in urban slums in India revealed that although 62% of participants had good understanding about hypertension, only 42.75% implemented healthy behaviors.[19] Similarly, a study conducted in Thailand found high level of hypertension knowledge but poor adherence to dietary and exercise practices among older adults.[20] Another study in India reported strong knowledge

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and positive attitude scores but low practice scores among hypertensive patients.[21] A study in North India found that 72.3%, 77.7%, and 82.8% of participants had poor scores in knowledge, attitude, and practice regarding hypertension, respectively.[22]

Research on hypertension knowledge shows varying levels of awareness among different populations. In Saudi Arabia, both hypertensive and non-hypertensive individuals exhibit a high level of knowledge about risk factors, diet, and lifestyle modifications related to hypertension.[23] However, a Pakistani study revealed that only 33.64% of non-hypertensive adults had sufficient hypertension knowledge, with notable gaps in medication adherence and awareness of complications.[24] In Iraq, hypertensive university employees demonstrated moderate levels of knowledge, with higher scores in lifestyle awareness but lower scores in understanding the definition of hypertension.[25] A study in Jordan reported generally good knowledge, especially regarding lifestyle and complications, but lower scores in understanding the definition of hypertension and dietary practice.[26] Across various studies, education level consistently proved to be a key factor influencing hypertension knowledge, with higher education showing greater awareness

Research on hypertension knowledge and attitudes in Iraq presents mixed results. A study in Baghdad found that more than 60% of hypertensive patients had good knowledge and 80% displayed positive attitudes, yet only 24% exhibited good practices. Knowledge was significantly correlated with age, gender, education level, and family history. Another study at the University of Baghdad reported an average hypertension knowledge score of 62.7%, with education level and time since diagnosis identified as significant factors.[27]

A study on hypertension self-management practices identified several factors linked to improved adherence. Older age (≥65 years) is consistently associated with better self-care practices and greater adherence to medication.[28] Higher levels of education, especially university education, correlate with more effective hypertension management.[29] Patients with chronic health conditions, exhibited mixed results, with certain studies suggesting poorer self-care practices among individuals with pulmonary comorbidities. Social support, such as living with family, has a positive impact on treatment adherence. Interventions like community health coaches and personalized education programs have proven effective in enhancing hypertension knowledge, increasing readiness to adopt behavioral changes, and improving clinical outcomes such as blood pressure control.[30]

Limitations of the Study

This study has several limitations that should be recognized. Firstly, the cross-sectional design restricted the ability to determine causal relationships between the variables. Secondly, the sample was limited to employees from three universities in Erbil, which may limit the generalizability of findings to other populations or regions. Thirdly, the use of self-reported data collected through questionnaires introduces the potential for response bias, including social desirability bias or inaccuracies in recall. Furthermore, the categorization of KAP scores into percentage-based tiers, although common in KAP research, may oversimplify the complexity of health behaviors and attitudes. The study also did not evaluate the validity of the questionnaire within the local cultural context, which could affect the reliability of the responses. Finally, factors such as access to healthcare services, cultural influences, and environmental determinants of hypertension were not examined, potentially overlooking key variables that could impact KAP outcomes. Addressing these limitations in future research could

offer a more thorough understanding of hypertension-related KAP.

Conclusion

This study underscores the critical need to enhance hypertension awareness and prevention among university employees. While knowledge of hypertension is moderate, significant gaps persist in understanding its risk factors and preventive measures, with poor lifestyle choices. Factors such as health workshops, job roles, and educational background appear to influence awareness levels. Universities should consider implementing targeted interventions; including routine blood pressure screenings and well-designed educational workshops, that promotes healthy behaviors. Collaborative efforts with healthcare providers to offer personalized management plans could further improve hypertension control. Future research should investigate the long-term effects of workplace health programs and explore how cultural and environmental factors influence hypertension management.

Competing interests

The author declares that he has no competing interests.

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