Duration of Hypertension and Its Relationship with Knowledge, Self-efficacy and Compliance

Lienngailhing Khongsai and Usha Chivukula
University of Hyderabad,Hyderabad

Hypertension, also referred to as high blood pressure, is a chronic condition that has long-lasting consequences. The disease poses a significant public health challenge in both India and beyond. The main aim of this study is to examine the relationship between knowledge, self-efficacy and compliance among hypertension patients. Additionally, the study intends to evaluate the group differences based on the duration of the disease with respect to the variables under examination. The sample consisted of a total of 247 primary hypertensive patients within an age group of 30 to 75 years (M=52.63, SD= 10.43); male (n= 108), female (n= 139), who were seeking treatment from different cardiac hospitals and clinics. Participants were administered questionnaires to assess their knowledge of Hypertension, health-specific self-efficacy, compliance. Alongside personal information such as age, gender and duration of disease was also noted. Pearson's product moment correlation and One-way ANOVA was used for data analysis. A significant relationship was found between disease duration, knowledge about hypertension, health-specific self-efficacy, and compliance with hypertension treatment. The study also showed that three groups of hypertensive patient viz. onset of hypertension- one year; one year- five years and five years and above differed in knowledge relating to general awareness, overall hypertension knowledge, alcohol resistance self-efficacy, overall health specific self-efficacy, medication compliance, self-monitoring, and overall hypertension compliance. The study highlights the necessity of increasing awareness and education among individuals who are at a heightened risk of hypertension.

Keywords: hypertension, knowledge, self-efficacy, compliance, duration of disease

Hypertension is a significant public health concern in India (Sivadasanpillai et al., 2014; Srinath et al., 2005; Yadavar, 2018). It is estimated that a minimum of 25% of the Indian population suffers from hypertension, whereas only around 12% of these persons effectively manage their blood pressure (WHO, 2022). Hypertension, which refers to uncontrolled blood pressure, is a significant contributing factor to cardiovascular diseases (CVDs). These diseases, such as kidney failure, strokes, and heart attacks are the primary causes of both illness and death in India (WHO, 2022). According to the National Family Health Survey (NFHS-5) (2019-2021), the hypertension rate in males was 24%, whilst in women it was 21%. This showed an increase from the previous round NFHS-4 (2015–16), where the rates were 19% for men and 17% for women respectively (Sahadevan et al., 2023). In 2010, the Indian government implemented the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) with the aim of reducing non-communicable disease (NCD)-related deaths in India (Chakraborty et al., 2022). By 2025, it is projected that 75 million individuals with Hypertension will be receiving routine care in primary healthcare settings (WHO, 2023).

Hypertension is a disease of great concern because of its asymptomatic nature and often goes unrecognised by patients till they are diagnosed and when they reach life-threatening situation stage. Disease management being the only sole solution for hypertension, necessitates the patients be informed and made aware of their hypertensive symptoms. The knowledge and understanding of these symptoms have a significant impact on adhering to the lifelong treatment regimen (Almas et al., 2012). Research shows that significant number of patients do not achieve controlled blood pressure levels (Nadeem et al., 2019) despite their awareness of the disease. This illustrates a deficiency in the implementation of preventive measures concerning risk factors associated with hypertension.

Recent reports have highlighted the significance of raising awareness and the influence of hypertension education programmes regarding prevention on management of hypertension. Patients who had the knowledge regarding the negative impact of raised blood pressure levels on life expectancy exhibited a greater degree of adherence to medication usage and follow-up appointments compared to patients lacking this understanding (Subburayan, 2023). Surveys conducted among hypertensive patients revealed that a lack of awareness regarding the target systolic blood pressure (SBP) level was identified as a separate factor that predicted inadequate blood pressure (BP) control (Knight et al., 2001). Beigi et al., (2014) found that education programmes emphasising knowledge of high blood pressure, self-management and modification in lifestyle habits successfully led to blood pressure reductions as well as better compliance with medication use.

Self-efficacy which refers to a patient's belief on oneself about performing certain activities, has a crucial role in influencing one's level of involvement in self-care activities for effectively managing hypertension (Tan et al., 2021). It is one's optimistic self-belief which can not only induce a sense of control over one's environment but also enhance the self-care activities in hypertensive patients. These include attaining knowledge regarding the disease and managing lifestyle and were also found to have significant role in the outcome of the patient's health status (Williams et al., 2018). Consistent adherence to self-care practices, can prevent the onset of hypertension, enhance the management of blood pressure, and facilitate early detection to prevent chronic implications of hypertension (Tan et al., 2022).

The risk of cardiovascular disease (CVD) in hypertensive patients increases gradually as the duration of disease increases (Kim et al. 2019; Mefford et al. 2020; Zheng et al., 2022). These findings indicate that the duration of hypertension (HTN) significantly contribute to the risks of cardiovascular disease (CVD) beyond just controlling blood pressure (BP) levels. Studies on duration of disease and illness perception showed varied findings. A study in Malaysia (Norfazilah et al., 2013) found no association between illness perception and duration of illness. While another study by Broadbent et al. (2006) found a significant association between illness perception and duration of disease. Yet another study found that patients with higher disease duration regarded hypertension as a significantly threatening condition and therefore exhibited a strong sense of personal and treatment management (Shakya et al., 2020). The present study is an attempt to find the relationship between knowledge, self-efficacy and compliance of hypertensive patients. The study also attempts to find the level of difference in knowledge, self-efficacy and compliance in different groups of disease

duration. The objectives of the present study are

1. To assess the relationship between duration of disease, knowledge, self-efficacy and compliance among primary hypertensive patients.

2. To evaluate the group differences among the patients' in their level of knowledge, self-efficacy and compliance categorized on the basis of their duration of disease.

Method

Sample

The data consisted of 247 primary hypertensive patients with an age group of 30 to 75 years (M=52.63, SD= 10.43) diagnosed with hypertension. The patients were classified into three groups according to the duration of their disease. The three categorical groups were Group-I- onset of disease to 1 year; Group-II- 1 year to 5 years; Group-III; 5 years and above. Patients with comorbidities or psychiatric conditions were excluded from the study.

Measures

The tools used for the study are described below.

Personal information form: The form included details of the patients including their age, gender, level of education and duration of disease.

Hypertension knowledge test (Andrew & Hariharan, 2017): The test comprised 22 items that evaluate four domains of knowledge regarding hypertension i.e. general awareness, lifestyle, causes, care & causality and management of medication. The coefficient of test-retest reliability was .92.

Health specific self-efficacy scale (Schwarzer & Renner, 2009): It is a 13 items scale that evaluated three specific dimensions: nutrition self-efficacy, physical exercise self-efficacy, and alcohol resistance self-efficacy. The value of Cronbach's á was discovered to be .79.

Hypertension compliance scale (Swain et al., 2015): The scale comprises 15 items and employs a 4-point response scale. The four dimensions encompasses compliance to medication, diet, exercise and self-monitoring. The Cronbach's á coefficient was calculated to be .67.

Data analysis

The obtained data was analysed using IBM SPSS vs. 26. Descriptive statistics, Pearson's product moment correlation coefficient (Pearson's r), One-way ANOVA analysis and Tukey's HSD test were used to analyse the data.

Procedure

Participants were recruited from several cardiac hospitals and clinics within Imphal city, India after taking required permissions and obtaining ethical approval from the concerned authorities. Informed consent was first given to the patients who agreed to participate in the study followed by administering of the questionnaires. The data analysed using SPSS version 26.

Results

The correlation analysis as reported in Table-1 shows a significant relationship between duration of disease and general awareness r=.19 **; total score of hypertension knowledge r= .16*; alcohol resistance self-efficacy r= .16*; health specific self-efficacy total r= .15*; compliance to medication r= .20**; diet r= .13*; exercise r= .13*; self-monitoring r= .17** and total hypertension compliance r= .25**. The total score of hypertension knowledge was positively correlated with dimensions of health specific self-efficacy (alcohol resistance self-efficacy r= .17**; health

specific self-efficacy total r= 13**); dimensions of hypertension compliance (medication r= 38**; diet r= 14*; exercise r= 13*, self-monitoring r= 20**; hypertension compliance total r= 38**). A positive correlation was also found between total score of health specific self-efficacy and dimension of hypertension knowledge (causes, care & causality r= .22**) and dimensions of hypertension compliance (diet r= 13*; exercise r= 15*; hypertension compliance total r= 13*). Total score of hypertension compliance was also positively related to dimensions of hypertension knowledge (general awareness r= .19**; lifestyle r= .26**; causes, care & causality r= .27**; management of medication r= .31**; total hypertension knowledge r= .38**) and dimensions of health specific self-efficacy (alcohol resistance self-efficacy r= .15*; and total health specific self-efficacy r= .13*).

Table 1. The correlation between duration of disease, knowledge, self-efficacy, and compliance

	DOD	HKT(GA)	HKT(L)	HKT(CCC)	HKT(MM)	HKTT	NSE	PSE	ASE	HSSE	M	D	E	Smon	COM
DOD	1														
HKT(GA)	.19**	1													
HKT(L)		.30**	1												
HKT(CCC)		.17**	.21**	1											
HKT(MM)		.24**	.44**	.25**	1										
HKT(T)	.16*	.63**	.73**	.61**	.72**	1									
NSE				.16*			1								
PSE				.13*			.18**	1							
ASE	.16*			.20**		.17**	.46**	.30**	1						
HSSE	.15*			.22**		.13*	.72**	.73**	.74**	1					
M	.20**	.20**	.29**	.24**	.30**	.38**					1				
D	.13*			.16*	.13*	.14*				.13*	.24**	1			
E	.13*			.13*		.13*			.13*	.15*	.22**	.96**	1		
Smon	.17**	.15*	.13*		.14*	.20**						.14*		1	
COM	.25**	.19**	.26**	.27**	.31**	.38**			.15*	.13*	.83**	.69**	.64**	.37**	1

Notes.*p<.05;**p<.01; ***p<.001

DOD-Duration of disease; HKT (T)- Hypertension knowledge total; HKT (GA)- General awareness; HKT(L)- Lifestyle; CCC- Causes, care & causality; MM- Management of medication; NSE- Nutrition self-efficacy; PSE- Physical exercise self-efficacy; ASE- Alcohol resistance self-efficacy; HSSE- Health specific self-efficacy total; COM- Hypertension compliance total; M- Medication; D- Diet; E- Exercise; Smon- Self-monitoring.

Table 2 shows the significant differences found in the three variables taken i.e. knowledge, self-efficacy and compliance, among the three categorical groups based on the disease duration.

Hypertension knowledge

Table 2 indicate a statistically significant group difference in the total score of hypertension knowledge, $F_{(2,245)} = 3.26$, $p<0.01$ among the three groups.

Table 2. One-Way ANOVA of duration of disease and knowledge, self-efficacy and compliance among hypertensive patients

Duration of disease	Group-I (n=82)		Group-II (n=85)		Group-III (n=80)		One-way ANOVA Mean Square			Eta squared
Variables	M	SD	M	SD	M	SD	Between	Within	F(2, 247)	
HKT(T)	11.61	3.44	12.39	3.19	12.89	3.01	67.32	2521.69	3.26*	.03
HKT(GA)	2.95	1.12	3.12	1.18	3.50	1.18	12.81	328.63	4.75**	.04
HKT(L)	2.61	1.23	2.84	1.24	2.90	1.14	3.79	354.41	1.30	
HKT(CCC)	2.62	1.26	2.94	1.2	2.83	1.18	4.34	359.54	1.47	
HKT(MM)	3.43	1.28	3.49	1.17	3.66	1.24	2.38	369.2	.79	
HSSE	36.93	3.89	37.91	3.79	38.40	3.91	91.41	3640.01	3.06*	.02
NSE	14.56	2.10	14.51	1.59	14.83	1.60	4.74	770.99	.75	
PSE	12.95	2.16	13.46	1.94	13.60	2.24	18.1	1092.11	2.12	
ASE	9.41	1.50	9.94	1.37	9.98	1.37	16.2	486.56	4.06*	.03
Hypertension Compliance	41.70	4.83	43.66	4.59	44.80	5.35	400.7	5917.28	8.26***	.06
Medication	19.84	3.62	20.84	3.06	21.60	3.70	126.1	2929.83	5.25**	.04
Diet	9.52	1.35	9.94	1.43	9.95	1.25	9.72	440.96	2.69	
Exercise	8.80	1.11	9.15	1.2	9.18	1.03	7.07	303.44	2.84	
Self-monitoring	3.52	1.42	3.73	1.18	4.08	1.33	12.53	418.78	3.65*	.03

Notes. *p<.05; **p<.01; ***p<.001

M- Mean; SD- Standard deviation

Table 3. Tukey's multiple comparison test of duration of disease and knowledge, self-efficacy and compliance among hypertensive patients

Variables	Duration of disease		
	Group-I & Group-II	Group-I & Group-III	Group-II & Group-III
Hypertension knowledge	-.78	-1.28*	-.50
General awareness	-.17	-.55*	-.38
Lifestyle	-.23	-.29	-.07
Causes, care & causality	-.32	-.20	.12

Management of medication	-.07	-.24	-.17
Health specific self-efficacy	-.98	-1.47*	-.49
Nutrition self-efficacy	.06	-.26	-.32
Physical exercise self-efficacy	-.51	-.65	-.14
Alcohol resistance self-efficacy	-.53*	-.56*	-.03
Hypertension compliance	-1.96*	-3.11*	-1.14
Medication	-.99	-1.76*	-.77
Diet	-.42	-.43	-.01
Exercise	-.35	-.37	-.02
Self-monitoring	-.21	-.55*	-.35

Note. Group-I: 1month –1year, Group-II: 1-5 years, Group-III: above 5 years

*$p<0.05$

The impact of disease duration on knowledge of hypertension is small ($K^2 = 0.03$). Tukey's test (Table 3) revealed a statistically significant group difference in terms of their hypertension knowledge (MD=1.28, p<0.05) between Group-I (M=11.61, SD=3.44) & Group-III (M=12.89, SD=3.01) among the three groups.

Knowledge of general awareness

A notable statistical difference was seen among the three categorical groups in general awareness knowledge, as indicated by the F (2,245) = 4.75, p<0.01. The impact of disease duration on knowledge of general awareness is small ($K^2 = 0.04$). Table 3 revealed a significant disparity among Group-I (M=2.95, SD=1.12) & Group –III (M=3.50, SD=1.18) in general awareness (MD=.55, p<0.05).

Health specific self-efficacy

A significant group difference was found in the overall health-specific self-efficacy, as indicated by F (2,245) = 3.06, p<0.05. The impact of disease duration on health-specific self-efficacy is small ($K^2=0.02$). Table 3 revealed a significant disparity among Group-I (M=36.93, SD=3.89) & Group-III (M=38.40, SD=3.91) in terms of their health-specific self-efficacy (MD=1.47, p<0.05).

Alcohol resistance self-efficacy

A significant statistical group difference was observed in terms of their alcohol resistance self-efficacy, as indicated by the F (2,245) = 4.06, p<0.05. The impact of disease duration on alcohol resistance self-efficacy is small ($K^2=0.03$). Table 3 demonstrated a statistically significant distinction in their alcohol resistance self-efficacy (MD=.56, p<0.05) among Group-I (M=9.41, SD=1.50) & Group-III (M=9.98, SD=1.37).

Hypertension compliance

The study revealed a significant difference in medication compliance among the three categorical groups, as seen by the statistical analysis, F (2,245) = 8.26, p<0.001. A moderate impact of disease duration on compliance ($K^2=0.06$) was found. Table 3 revealed statistically significant difference among Group-I (M=41.70, SD=4.83) & Group-II (M=43.66, SD=4.59) in their compliance (MD=1.96, p<0.05). And also Group-I (M=41.70, SD=4.83) exhibited lower

compliance (MD= 3.11, p<0.05) compared to Group-III (M=44.80, SD=5.35).

Compliance to medication

The study revealed a significant difference in medication compliance among the three categorical groups, as seen by the statistical analysis, $F (2,245) = 5.25$, $p<0.01$. The disease duration impact on medication compliance is minimal ($K^2=0.04$). Table 3 revealed a statistically significant distinction within Group-I (M=19.84, SD=3.62) & Group-III (M=21.60, SD=3.70) in terms of their compliance to medicine (MD=1.76, p<0.05).

Self-monitoring

The study revealed a significant group difference in terms of their self-monitoring, as indicated by the $F (2,245) = 3.65.$, $p<0.05$. The effect of disease duration on self-monitoring is minimal ($K^2=0.03$). Table 3 revealed a statistically significant distinction within within Group-I (M=3.52, SD=1.42) & Group-III (M=4.08, SD=1.33) in terms of their adherence to self-management (MD=0.55, p<0.05).

Discussion

Due to the chronic nature of hypertension, there is an increased need for consistently maintaining the dietary habits, regular exercise, compliance to medication, and constant monitoring of their blood pressure levels. The disease trajectory also necessitates the patient to bring about these modifications which aid in disease management. As the patients deal with the disease, it becomes an integral part of their existence, necessitating regular adjustment, modifications, and search of effective methods to control the condition. With the experience of managing their condition, they frequently seek more information from medical professionals, acquaintances, and fellow patients to enhance their understanding of aspects that contribute to improved disease management.

The present study reveals an important finding that increase in duration of disease increases the knowledge, health specific self-efficacy and compliance among hypertensive patients. Patients diagnosed with hypertension for more than a year acquire more hypertension related knowledge compared to patients in their early stage of diagnosis as shown in our result. This could be as a result of the guidance they get from their physicians who demonstrated and enhanced their understanding of the disease condition (Tian et al., 2011). In addition, they have a tendency to gain hypertensive specific knowledge from alternative sources such as the internet or hypertension related literature as well (Samal et al., 2021). Consequently, these encounters with diverse and valuable information can improve their understanding and awareness of their illness. A deeper understanding of their disease management is found as the length of the disease progresses, primarily from their own experiential understanding of their body. Compared to patients who received treatment for less than two years, patients who had treatment for a longer period of time showed a higher degree of knowledge (Wolde et al., 2022). Studies have demonstrated that an individual's comprehension of a disease or ailment is impacted by variables like gender, age and duration of the illness (Abebaw et al., 2016).

Upon receiving a diagnosis, patient's need to modify and regulate their lifestyle choices with regards to their dietary habits, physical activity, and vigilant monitoring of their blood pressure levels. Self-efficacy has been demonstrated to be essential to help patients comply with the prescribed medication regimen and undertake the necessary lifestyle adjustments. According to our present findings, patients may first lack the necessary efficacy to adopt the required adjustments in the initial diagnosis stage. Engaging in consistent practice of required

modifications over time enhances individuals' self-efficacy and drives them to maintain these alterations despite occasional obstacles (Tan et al., 2021). Attaining their objectives in managing their regimen creates a feedback cycle that strengthens their self-efficacy over time.

Higher knowledge regarding hypertension has also been linked to enhancing self-efficacy in patients. As patients gain deeper understanding of the disease, they develop a greater sense of assurance, thereby improving their self-efficacy which helps them in effectively handling their daily tasks and making dietary and lifestyle modifications. Patients' adherence to the treatment regimen prescribed by healthcare professionals tends to increase as they acquire more information about the various risk factors such as alcohol intake (Huntgeburth et al., 2005). During the early phase of diagnosis, individuals may show hesitancy and display medical test anxiety due to fear. However, as the duration of their disease and the frequency of their hospital visits increase, patients gradually become more aware and grow accustomed to the healthcare system. They begin to develop a greater level of comfort with both the medical professionals and the whole process of treatment. Consequently, this leads to improving their self-efficacy in the whole treatment process. A study conducted on older patients with longer disease duration indicated higher self-efficacy in self-care, compared to the younger age group with shorter disease duration (Lee et al., 2010). An additional study found a significant positive association of self-efficacy with the duration of a chronic illness. Moreover, the length of the illness and efficacy expectations influenced the heterogeneity in self-care activity (Wu et al., 2007).

The patient's adherence to the treatment and lifestyle regimen is solely determined by their own decision-making. The findings show that, in comparison to patients with longer hypertensive duration, newly diagnosed patients with a duration of hypertension of one month to one year demonstrated poor medication adherence and self-monitoring. The treatment's complexity including dosage and administration of medication, the medication's side effects, and forgetfulness or as a result of denial which is commonly experienced during the initial year of diagnosis can contribute to a decrease in adherence. A strong association was found between the duration of diagnosis with hypertension and the length of time they had been taking medication and their adherence to treatment (Shakya et al., 2020). Nevertheless, as the treatment advances, patients begin to observe the advantages of their compliance in terms of symptom reduction, which in turn leads to an increase in their adherence.

Conclusion

The study's findings show that, among the three category groups categorised by the disease duration, there is a substantial reported variation in the level of the variables examined. Patients with an illness duration exceeding five years demonstrated higher knowledge of hypertension, including general awareness compared to those with an illness duration of less than one year. This suggests that individuals with a duration of less than one year need a greater amount of information and understanding of the condition in order to effectively manage it. Similarly, patients who had been living with hypertension for longer periods had higher levels of self-efficacy compared to patients who had been experiencing symptoms for less than one year. Patients with longer duration of disease also had higher compliance to treatment compared to patients below one year of duration of disease. The primary significance of this study is in its emphasis on the need to enhance knowledge of the nature of hypertension and improve

the self-efficacy of hypertensive patients during their initial diagnosis stage, which will in turn enable them to effectively adhere to the treatment regimen.

References

Almas, A., Godil, S. S., Lalani, S., Samani, Z. A., & Khan, A. H. (2012). Good knowledge about hypertension is linked to better control of hypertension; a multicentre cross sectional study in Karachi, Pakistan. BMC research notes, 5, 579. https://doi.org/10.1186/1756-0500-5-579

Abebaw, M., Messele, A., Hailu, M., & Zewdu, F. (2016). Adherence and associated factors towards antidiabetic medication among type II diabetic patients on follow-up at University of Gondar Hospital, Northwest Ethiopia. Advances in nursing, 2016, 1-7. https://doi.org/10.1155/2016/8579157

Andrew, A., & Hariharan, M. (2017). Hypertension knowledge test: Development and validation. International Journal of Indian Psychology, 5(1), 44-55. https://doi.org/10.25215/0501.045

Beigi, M. A. B., Zibaeenezhad, M. J., Aghasadeghi, K., Jokar, A., Shekarforoush, S., & Khazraei, H. (2014). The effect of educational programs on hypertension management. International cardiovascular research journal, 8(3), 94–98.

Broadbent, E., Petrie, K. J., Main, J., & Weinman, J. (2006). The brief illness perception questionnaire. Journal of psychosomatic research, 60(6), 631–637. https://doi.org/10.1016/j.jpsychores.2005.10.020

Chakraborty, S., Rai, R. K., Biswas, A. K., Barik, A., Gurung, P., & Praveen, D. (2022). Health care seeking behaviour and financial protection of patients with hypertension: A cross-sectional study in rural West Bengal, India. Plos one, 17(2), e0264314. https://doi.org/10.1371/journal.pone.0264314

Huntgeburth, M., Ten Freyhaus, H., & Rosenkranz, S. (2005). Alcohol consumption and hypertension. Current hypertension reports, 7(3), 180–185. https://doi.org/10.1007/s11906-005-0007-2

Kim, T. H., Yang, P. S., Yu, H. T., Jang, E., Shin, H., Kim, H. Y., Uhm, J. S., Kim, J. Y., Sung, J. H., Pak, H. N., Lee, M. H., Joung, B., & Lip, G. Y. H. (2019). Effect of hypertension duration and blood pressure level on ischaemic stroke risk in atrial fibrillation: nationwide data covering the entire Korean population. European heart journal, 40(10), 809–819. https://doi.org/10.1093/eurheartj/ehy877

Knight, E. L., Bohn, R. L., Wang, P. S., Glynn, R. J., Mogun, H., & Avorn, J. (2001). Predictors of uncontrolled hypertension in ambulatory patients. Hypertension (Dallas, Tex.: 1979), 38(4), 809–814. https://doi.org/10.1161/hy0901.091681

Lee, J. E., Han, H. R., Song, H., Kim, J., Kim, K. B., Ryu, J. P., & Kim, M. T. (2010). Correlates of self-care behaviors for managing hypertension among Korean Americans: a questionnaire survey. International journal of nursing studies, 47(4), 411–417. https://doi.org/10.1016/j.ijnurstu.2009.09.011

Mefford, M. T., Goyal, P., Howard, G., Durant, R. W., Dunlap, N. E., Safford, M. M., Muntner, P., & Levitan, E. B. (2020). The association of hypertension, hypertension duration, and control with incident heart failure in black and white adults. Journal of clinical hypertension (Greenwich, Conn.), 22(5), 857–866. https://doi.org/10.1111/jch.13856

Nadeem, M. K., Mari, A., Iftikhar, S., Khatri, A., Sarwar, T., & Patel, M. J. (2019). Hypertension-related Knowledge and Its Relationship with Blood Pressure Control in Hypertensive Patients Visiting a Semi-private Tertiary-care Charity Hospital in Karachi, Pakistan. Cureus, 11(10), e5986. https://doi.org/10.7759/cureus.5986

Norfazilah, A., Samuel, A., Law, P., Ainaa, A., Nurul, A., Syahnaz, M. H., & Azmawati,

M. N. (2013). Illness perception among hypertensive patients in primary care centre UKMMC. Malaysian family physician: the official journal of the Academy of Family Physicians of Malaysia, 8(3), 19–25.

Sahadevan, P., Sasidharan, A., Bagepally, B. S., Pal, A., Kumari, D., Kaur, P., ... & Kamal, V. K. (2023). Prevalence and risk factors associated with undiagnosed hypertension among adults aged 15–49 in India: insights from NFHS-5 national survey. https://doi.org/10.21203/rs.3.rs-2899509/v1

Samal, L., Fu, H. N., Camara, D. S., Wang, J., Bierman, A. S., & Dorr, D. A. (2021). Health information technology to improve care for people with multiple chronic conditions. Health services research, 56 Suppl 1(Suppl 1), 1006–1036. https://doi.org/10.1111/1475-6773.13860

Shakya, R., Shrestha, S., Gautam, R., Rai, L., Maharjan, S., Satyal, G. K., Kc, B., & Rai, M. K. (2020). Perceived Illness and Treatment Adherence to Hypertension Among Patients Attending a Tertiary Hospital in Kathmandu, Nepal. Patient preference and adherence, 14, 2287–2300. https://doi.org/10.2147/PPA.S270786

Sivadasanpillai, H., Leeder, S., MH, J. P., & Dorairaj, P. A race against time: the challenge of cardiovascular diseases in developing economies. Centre for Chronic Disease Control, New Delhi, India (2014). http://www.ccdcindia.org/A-RACE-AGAINST-TIME.pdf

Srinath Reddy, K., Shah, B., Varghese, C., & Ramadoss, A. (2005). Responding to the threat of chronic diseases in India. Lancet (London, England), 366(9498), 1744–1749. https://doi.org/10.1016/S0140-6736(05)67343-6

Subburayan Y (2023) Education about Hypertension and Its Impact on Knowledge, Lifestyle Choices, and Blood Pressure Control in the UK: A Systematic Review. J Community Med Public Health 7: 348. https://doi.org/10.29011/2577-2228.100348

Swain, S., Hariharan, M., Rana, S., Chivukula, U., & Thomas, M. (2015). Doctor-patient communication: impact on adherence and prognosis among patients with primary hypertension. Psychological Studies, 60, 25-32. https://doi.org/10.1007/s12646-014-0291-5

Schwarzer, Ralf & Renner, Britta. (2009). Health-Specific Self-Efficacy Scales.

Tan, F. C. J. H., Oka, P., Dambha-Miller, H., & Tan, N. C. (2021). The association between self-efficacy and self-care in essential hypertension: a systematic review. BMC family practice, 22(1), 44. https://doi.org/10.1186/s12875-021-01391-2

Tan, P. P. S., Sandhu, R. S., Zain, S. M., Hall, D., Tan, N. C., Lim, H. M., ... & Pung, Y. F. (2022). Health motivations and perceived barriers are determinants of self-care behaviour for the prevention of hypertension in a Malaysian community. Plos one, 17(12), e0278761. https://doi.org/10.1371/journal.pone.0278761

Tian, M., Chen, Y., Zhao, R., Chen, L., Chen, X., Feng, D., & Feng, Z. (2011). Chronic disease knowledge and its determinants among chronically ill adults in rural areas of Shanxi Province in China: a cross-sectional study. BMC public health, 11(1), 1-9. https://doi.org/10.1186/1471-2458-11-948

Williams, B., Mancia, G., Spiering, W., Agabiti Rosei, E., Azizi, M., Burnier, M., ... & Desormais, I. (2018). 2018 ESC/ESH Guidelines for the management of arterial hypertension: The Task Force for the management of arterial hypertension of the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH). European heart journal, 39(33), 3021-3104. https://doi.org/10.1093/eurheartj/ehy686

Wolde, M., Azale, T., Debalkie Demissie, G., & Addis, B. (2022). Knowledge about hypertension and associated factors among patients with hypertension in public health facilities of Gondar city, Northwest

Ethiopia: Ordinal logistic regression analysis. PloS one, 17(6), e0270030. https://doi.org/10.1371/journal.pone.0270030

World Health Organization. (2022). India hypertension control initiative, a high impact and low-cost solution. https://www.who.int/india/news/detail/02-06-2022-india-hypertension-control-initiative–a-high-impact-and-low-cost-solution

World Health Organization (2022). UN award for high-impact India hypertension control initiative. https://www.who.int/india/news/detail/25-09-2022-un-award-for-high-impact-india-hypertension-control-initiative

World Health Organization. (2023). India: 75 million people with hypertension or diabetes on standard care by 2025. https://www.who.int/southeastasia/news/detail/18-05-2023-india-75-million-people-with-hypertension-or-diabetes-on-standard-care-by-2025

Wu, S. F., Courtney, M., Edwards, H., McDowell, J., Shortridge-Baggett, L. M., & Chang, P. J. (2007). Self-efficacy, outcome expectations and self-care behaviour in people with type 2 diabetes in Taiwan. Journal of clinical nursing, 16(11C), 250–257. https://doi.org/10.1111/j.1365-2702.2006.01930.x

Yadavar, S. (2018). High Blood Pressure Killed 1.6 Mn Indians In 2016, But Most Are Unaware Of Its Dangers. IndiaSpend. https://www.ind iaspend.com/high-blood-pressure-killed-1-6-mn-indians-in-2016-but-most-are-unaware-of-its-dangers-94201/

Zheng, Y., Gao, X., Jia, H. Y., Li, F. R., & Ye, H. (2022). Influence of hypertension duration and blood pressure levels on cardiovascular disease and all-cause mortality: A large prospective cohort study. Frontiers in cardiovascular medicine, 9, 948707. https://doi.org/10.3389/fcvm.2022.948707

Lienngailhing Khongsai, Research Scholar, Centre for Health Psychology, University of Hyderabad,Telangana

Usha Chivukula, PhD, Assistant Professor, Centre for Health Psychology, University of Hyderabad, Telangana