

Knowledge about Hypertension: A Comparison between Hypertensive patients and their Normotensive counterparts

Rithuma Oruganti¹, Swathi Paidipati², Manjunath Dinaker³

¹(Psychology Department, Osmania University, India)

²(Psychology Department, Osmania University, India)

³(Internal Medicine, GYD Diagnostics, India)

Corresponding Author: Rithuma Oruganti

Abstract:

Background: High blood pressure also known as hypertension, is a chronic non-communicable disease condition, in which the force of the blood pushing against the walls of the blood vessels is consistently too high. The World Health Organization has termed hypertension as the “silent killer” as it is an asymptomatic condition and the health related complications of high blood pressure are life-threatening. In recent times, there has been an exponential increase, in hypertension related incidence and prevalence rates in India. However, a lack of knowledge about the condition among the general population and poor treatment and control rates among the hypertensive patients calls for the implementation of health education and promotion programs.

Method: The present study aimed to understand the level of knowledge, conceptualization, health beliefs and misconceptions among the hypertensive and normotensive participants regarding the condition of hypertension using a qualitative approach. Semi-structured interviews using an open-ended interview schedule comprising of 17 open-ended questions were conducted among 96 hypertensive and 103 normotensive participants in the age-group of 22-66 years. Content analysis was used to analyze the transcripts using the thematic analysis method.

Results: The analysis of participant’s responses brought out several sub-themes that were categorized into themes and the themes were further integrated to develop four superordinate themes of theoretical, essential, lifestyle-related, and functional knowledge regarding hypertension. Overall the level of knowledge about hypertension among the study participants was found to be inadequate. The hypertensive participants in our study were found to possess better knowledge and a lower number of misconceptions about their condition as compared to the normotensive participants.

Keywords: hypertension knowledge, misconceptions, BP control, health beliefs, health education

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I. Introduction

Hypertension is a condition in which the blood vessels have persistently elevated pressure, and is basically of two types – primary and secondary hypertension. Primary or essential hypertension is a condition where the cause is unknown, and secondary hypertension is caused by a known disease condition or some other abnormality of the body, such as kidney disease, pregnancy, or tumours of the adrenal glands. Hypertension is defined as having a systolic blood pressure of 140 mm Hg or more and a diastolic blood pressure of 90 mm Hg or more. The etiology of a condition like hypertension has been found to be multi-factorial including genetic, biological, psychological, social, and environmental components, each having a cascading effect on the other.

The World Health Organization has recognized hypertension as the “silent killer” due to the asymptomatic nature of the condition leading to “target organ” damage (World Health Organization, 1992). The health related complications of hypertension are life-threatening and include heart attack, brain stroke, paralysis, kidney failure, blood vessel damage and vision loss.

Globally, the prevalence of high blood pressure was found to be around 40% in low and middle income countries and 35% in high income countries, and hypertension has been estimated to cause 7.5 million deaths which is about 12.8% of the total of all deaths annually (World Health Organization, 2018). According to a recent cross-sectional population-based study, conducted among 1.3 million Indians across 27 states in India between the years 2012 and 2014, the prevalence of hypertension in India was found to be 25% with the prevalence of the disease being modestly lower among rural and socio-economically disadvantaged groups (Geldsetzer et al., 2018).

High blood pressure has been found to be responsible for over 1.6 million deaths in India, accounting for 17.5% of all deaths and 9.7% of disability-adjusted life years (Yadavar, 2018). Hypertension has been found to cause 53.8% of deaths due to heart disease, 55.7% of deaths due to stroke, and 54.3% of deaths due to chronic

kidney disease in India (Yadavar, 2018). Another recent study has shown that the prevalence of hypertension in India, has been found to range from 25% to 30% in urban adults and 10% to 20% among rural adults, with the condition accounting for 11% of the total number of deaths annually (Gupta & Gupta, 2017; Ram, 2017). Thus hypertension afflicts nearly 174 to 291 million of the population of India, with approximately 116 to 195 million of the population, unaware of their hypertensive status.

Hypertension has been found to cause approximately 1.1 million deaths annually in India, and the medical expenditure incurred from the untreated complications of hypertension, has been found to be approximately 20 billion dollars (Ram, 2017). This warrants serious concern by the health care system, given the economic, and social costs of treating the health complications of hypertension.

Improving knowledge and awareness about the condition among the general community will serve to facilitate the early detection, diagnosis, treatment, and control of this chronic health condition. The World Hypertension League posits that worldwide, nearly 50% of those with high blood pressure, were found to be unaware of their hypertensive status (Chockalingam, 2008; Witten, Vuuren, & Learmonth, 2013). Hypertension has been found to be responsible for 45% of deaths due to heart disease and 51% of deaths due to stroke (World Health Organization, 2013). Due to weak health systems, the number of hypertensives who are undiagnosed, untreated, and uncontrolled are higher in low and middle income countries as compared to high income countries (World Health Organization, 2013).

Addressing behavioral risk factors such as unhealthy food consumption, harmful alcohol and tobacco use, obesity, and persistent exposure to stress can reverse the trend of this rapidly increasing epidemic, lowering mortality rates worldwide. Misconceptions and incorrect health beliefs rooted in the long-standing culture of a society, can lead to incorrect dietary and lifestyle choices, resulting in the development and poor management of a chronic condition such as hypertension. Multiple social and economic barriers, that were found to impede health seeking behaviors in hypertension control, were found to be: residence in informal settlement areas, long distance commutes, low socio-economic status, poor health awareness and knowledge, poverty, low levels of education, high stress levels, and cultural perceptions of food types (Witten, Vuuren, & Learmonth, 2013).

The prevalence of hypertension among adults in the state of Telangana, was found to range from 30% to 35% with less than 10% aware of their hypertensive status (Ram, 2017). In our review of literature, we found that few qualitative studies have been conducted in the state of Telangana, to examine the knowledge, conceptualization, and health beliefs of hypertensive and normotensive participants about the condition of hypertension. Given the escalating burden of hypertension among the Indian population, health promotion interventions focusing on improving knowledge and awareness about hypertension, can serve to mitigate the deleterious health complications of this non-communicable epidemic. Hence this study was conducted to explore the knowledge, conceptualizations, and misconceptions about raised blood pressure, among hypertensive and normotensive participants using content analysis. As knowledge, perceptions, and health beliefs about the condition of hypertension were known to influence health behaviors, self-management, adherence, and clinical outcomes, it was considered necessary and relevant to obtain qualitative data from hypertensive and normotensive participants. A related objective of the present study, was to compare the hypertensive and normotensive participants with regard to the knowledge, conceptualizations and misconceptions about the condition of hypertension. By taking the perspectives of both the hypertensive and normotensive respondents in our study, we aimed to develop an intervention for the appropriate management and control of a chronic condition like hypertension.

II. Method

In this study, a qualitative approach was adopted to assess the level of knowledge, health beliefs and misconceptions of participants about hypertension as well as to compare the knowledge levels and misconceptions of the hypertensive and normotensive participants. A qualitative design was used to facilitate a rich in-depth description of people's understanding of the condition of hypertension. Therefore a cross-sectional semi-structured interview was designed to elicit rich in-depth information from the participants. Atlas.ti and MS-Excel software's were used to code and analyze the qualitative data. Ethical approval was obtained from Osmania University and the GYD Health Research Ethics Committee.

Participants

For this qualitative study, 215 participants from an outpatient primary care facility and a community setting were approached from which 16 participants refused to participate. The method of purposive sampling was used to recruit study participants. Out of the finally recruited 199 participants, 96 were hypertensive participants and 103 were normotensive participants. Of the recruited hypertensive participants, 48 were from an outpatient primary care clinic and the remaining 48 were from a general community setting of Hyderabad, India. Of the normotensive participants included in the study, 52 were from the outpatient primary care clinic and 51 participants were from the general community. The inclusion criteria for the hypertensive patients were an age

range of 22-66 years, willingness to provide written informed consent and a confirmed diagnosis of primary hypertension. The exclusion criteria for hypertensive patients were the presence of secondary hypertension, co-morbid conditions such as diabetes, and the presence of a psychiatric illness. The inclusion criteria for the normotensive group were an age range of 22 to 66 years and an absence of a diagnosis of primary hypertension. The exclusion criteria for the normotensive group were the presence of diabetes mellitus, secondary hypertension, and the presence of a psychiatric illness.

Out of the 199 subjects, 52% were men and 48% were women. The age of the sample ranged between 22 and 66 years with a mean age of 49 years. Out of the 96 hypertensive participants, 45.9% were men while 54.1% were women, whose age ranged between 26 to 65 years with the mean age of 57.33 years. Out of the 103 normotensives, 57.5% were men while 42.5% were women, whose age ranged between 22 to 66 years with a mean age of 41.4 years. Further, 62.5% of hypertensive and 44.7% of normotensive participants reported having a family history of hypertension.

Procedure

After selection of the primary care outpatient clinic through the method of purposive sampling, ethical informed consent was obtained from the management of the primary care outpatient clinic and from all the participants.

A one to one semi-structured interview was then conducted with all the participants to obtain qualitative data for the study. The first author carried out all the interviews in the mother tongue of the respondents. Firstly rapport was established, and each participant was exposed to the semi-structured interview format with the length of the interviews ranging from 30 minutes to 1 hour with a mean length of 32 minutes. Longer interview times were not followed keeping in mind fatigue and mental saturation effects. In certain cases, 2 to 3 sessions were carried out. During the process of interviewing open-ended questions were put to the participants, to generate rich and in-depth information about the condition of hypertension.

A semi-structured interview schedule containing 17 open-ended questions, on hypertension related knowledge, was used to facilitate discussion of key areas related to hypertension causation, management, and control. The open-ended questions aimed to elicit the participants understanding of hypertension, its etiology, management, type of lifestyle changes to be made for effective hypertension management and so on. The participants were encouraged to provide elaborate answers to the questions and were told that there were no right or wrong answers. In case the participant did not know the answer, he or she was free to say so. All of the interviews were audio-recorded and later transcribed verbatim by the first author. All the interviews were translated and back translated by two language experts to ensure accuracy in the transcriptions. In the interview sessions, the participants were asked to give their demographic and background details. All the interviews were conducted individually, to provide a conducive and non-threatening environment, in which participants could freely share their views and understanding of the condition of hypertension. Presence of family or friends could have induced cognitive resistance and hence a one to one interview format was used to elicit the most frank and honest response patterns from participants.

III. Results

Content Analysis

Content analysis was used to analyze the responses using the thematic method. The first author was involved in transcribing, reading and re-reading the transcripts. Three investigators then independently coded the responses of the participants and memos were written in the form of reflective notes about interesting ideas relating to the research question. A data-driven inductive approach was used to generate super-ordinate themes, themes and subthemes from the data. The responses were separately categorized into several sub-themes by the three investigators. The response categorization of the three investigators was compared for each participant and the agreement percentage was checked. The investigators had complete agreement for the responses of 180 (90%) respondents. The disagreement among the investigators regarding the responses of the remaining 19 (10%) respondents was resolved through discussion and consensus was reached leading to an agreement percentage of 100%. The responses of the participants brought out several sub-themes which were combined to form themes and the themes were integrated together to form the broad superordinate themes of theoretical, essential, lifestyle, and functional hypertension related knowledge. The four superordinate themes were mutually exclusive in nature. The qualitative software package, Atlas.ti and MS-Excel were used to code, manage, and analyze the qualitative data in the present study.

As shown in Table 1, the following four superordinate themes – “theoretical knowledge”, “essential knowledge”, “lifestyle knowledge”, and “functional knowledge” emerged with regard to the condition of hypertension. The responses that were related to the theoretical aspects of hypertension such as the duration of high BP, and the normal systolic and diastolic values of BP reading were classified under the superordinate theme of “theoretical knowledge”. The responses that were related to the significant aspects of hypertension

causation such as stress, unhealthy dietary habits, sedentary lifestyle and family history and the consequences of neglecting the condition such as heart attack, brain stroke, paralysis and kidney problems were classified under the superordinate theme of “essential knowledge”. Responses which were related to the lifestyle management of hypertension such as diet control, stress management, and exercise were classified under the superordinate theme of “lifestyle-related knowledge”. The responses which indicated the precautionary measures to be taken for the effective management of high blood pressure such as the importance of regular medication, consequences of missing medication, and the stoppage of anti-hypertensive medication were classified under the superordinate theme of “functional knowledge”. There was a possibility of more than one response from each participant.

Table 1: Summary of superordinate categories, themes and sub-themes with specific illustrative quotations

Superordinate Theme	Theme	Subtheme	Illustrative Response
Theoretical Knowledge	Duration of Hypertension	Lifelong	“Till your life ends BP will be there. There is no cure for BP”
		Temporary Lifestyle, Family & Situational Factors	“High BP is temporary & depends on tensions, temper & situations.” “Lifestyle, working style, family atmosphere & stress determine how long BP will last”
	Normal BP reading	120/80 Do not know	“Normal BP reading is 120/80” “Sorry, I do not know”
Essential Knowledge	Causes of Hypertension	Stress	“Tensions, sleeplessness & husband-wife conflicts cause high BP”
		Unhealthy Dietary Habits Do not know Family History Age Environmental Changes	“Unhealthy dietary habits like excessive salt, oil, spice & fast food intake cause hypertension” “Sorry, I do not know” “BP is hereditary” “BP is caused by increasing age” “Pollution, weather & climate change cause high BP”
	Consequences of Neglecting Hypertension	Health-related complications Adverse Effects Physical Symptoms of neglecting high BP Psychological Symptoms of neglecting high BP	“High BP leads to heart attack, kidney problems, stroke & paralysis” “It should not be neglected as our life will be in danger” “High BP leads to sweating, headache, giddiness & tiredness” “Neglecting BP causes people to get angry, tense & show hyper-behavior”
Lifestyle-Related Knowledge	Positive Lifestyle Changes	Diet Control	“Hypertensives should consume less salty, oily & fatty food”
		Stress Management Exercise Positive Outlook & Happiness Spiritual Orientation	“Stress & anxiety can be managed through yoga & meditation” “BP can be controlled by having 1 hour of exercise everyday” “People should have a positive outlook & be happy to manage high BP” “Should read devotional books, visit temples, & listen to spiritual songs to effectively manage BP”
Functional Knowledge	Missing Medication	Next day or Next time	“He should take next time or next day. If he skips in the morning, he has to take in the evening & vice-versa”
		No Adverse Consequences of Missing Medication Do not know Disruption in Normal Functioning	“There is no harm if a person forgets to take BP medication for one or two days.” “Sorry, I do not know” “If medicine is not taken, person will display anger & hyper-behavior”
	Stoppage of Anti-Hypertensive Medication	Lifelong use of BP Medication Stoppage of Medication when BP is controlled	“BP medication cannot be stopped & should be taken on a lifelong basis” “Some doctor had prescribed a medicine for my BP so I had taken it for 10 days & then discontinued it & it's been almost 4 years since I have

		Traditional Medicines	<p>taken any medicine. I am an example who discontinued medication. If the BP is controlled, I think it's not necessary to take the BP medicines permanently"</p> <p>"I don't agree with the allopathic system of research or medicine. Herbal medicines should be used to control high BP"</p>
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BP = Blood Pressure

It may be observed from Table 2, that the overall hypertension-related knowledge among the hypertensive and normotensive participants, was found to be inadequate. However, hypertensive participants were found to have better knowledge about hypertension, in the domains of theoretical, essential and functional knowledge. Although both the hypertensive and normotensive participants were found to possess various misconceptions about the condition of hypertension, a higher number of misconceptions were possessed by the normotensive participants. Table 2 shows the percentage of responses, under each theme and sub-theme for each of the superordinate categories, to allow for meaningful comparisons among the hypertensive and normotensive participants. It was dismal to note that some of the hypertensive participants lacked knowledge regarding the importance of regular medication adherence, calling for the urgent implementation of health education and promotion programs.

Table 2: Summary of percentages of sub-themes among the Hypertensive & Normotensive Participants

Superordinate themes & themes	Sub-themes	Hypertensive Participants	Normotensive Participants
Theoretical Knowledge			
Duration of high BP	Lifelong	52%	25%
	Temporary	24%	50%
	Lifestyle, Family & Situational Factors	24%	25%
Normal BP reading	120/80	42%	36%
	Do not know	58%	64%
Essential Knowledge			
Causes of Hypertension	Stress	44%	40%
	Unhealthy Dietary Habits	23%	22%
	Do not know	20%	20%
	Family History	5%	7%
	Age	5%	3%
	Environmental Changes	3%	8%
Consequences of Neglecting high BP			
Health-related complications	Heart Attack	28%	34%
	Paralysis	23%	17%
	Stroke	17%	11%
	Brain Damage	16%	18%
	Kidney Problems	16%	20%
Adverse Effects	Dangerous	22%	9%
	Nervous System Breakdown	11%	8%
	Death	6%	10%
Physical Symptoms of neglecting high BP	Sweating, Giddiness, Headache etc.	72%	55%
Psychological Symptoms of neglecting high BP	Neglecting high BP causes anger, tensions & hyper-behavior	28%	45%
Lifestyle-Related Knowledge			
Positive Lifestyle Changes	Diet Control	33%	29%
	Stress-Management	32%	32%
	Exercise	18%	22%
	Positive Outlook & Happiness	12%	13%
	Spiritual Orientation	12%	8%
Functional Knowledge			
Missing Medication	Next day or next time	50%	30%
	No Adverse Consequences of Missing Medication	20%	31%
	Do not know	16%	29%
	Disruption in Normal Functioning	14%	10%

Stoppage of Anti-Hypertensive Medication	Lifelong use of BP Medication	66%	60%
	Stoppage of Medication when BP is controlled	20%	36%
	Traditional Medicines	14%	11%

IV. Discussion

Improving knowledge about hypertension facilitates the early detection, diagnosis, treatment, and control of the condition, thereby reducing hypertension-related morbidity and mortality rates. The main finding of the current study, was that the overall knowledge about hypertension among the hypertensive and normotensive respondents, was found to be inadequate and various incorrect health beliefs and misconceptions were held by the study participants regarding the condition. However, the hypertensive participants were found to possess a higher level of knowledge, and fewer misconceptions regarding their condition as compared to the normotensive participants.

In the domain of theoretical knowledge, although both the hypertensive and normotensive participants were found to possess sub-optimal knowledge, a higher knowledge deficit was found to exist among the normotensive participants. An alarming finding of the study was that, 25% of the hypertensive and 52% of the normotensive respondents, felt that hypertension was a temporary condition. Another dismal finding of the study was that, 24% of the hypertensive and 25% of the normotensive respondents, felt that the duration of high blood pressure was determined by lifestyle, stress, and situational factors. Inadequate knowledge about hypertension was found to correlate with decreased treatment regimen compliance and increased mortality (Giuse, Koonce, Storrow, Kusnoor, & Ye, 2012; Desmedt & Valcke, 2004).

With regard to the domain of essential knowledge, it was found that although both the hypertensive and normotensive participants were observed to possess inadequate knowledge, the hypertensive participants had considerably better knowledge as compared to their normotensive counterparts. Both the hypertensive and normotensive participants in our study, correctly identified the causes of hypertension. Stress, depression, anger, and anxiety were correctly construed, as contributing to the causation and poor management of the condition of hypertension, by 44% of the hypertensive and 40% of the normotensive participants. Research has shown that multiple stressful life events significantly predict increased depression, poor quality of life, and poorer health outcomes for those living in impoverished areas (Witten, Vuuren, & Learmonth, 2013; Han, Kim, Rose, Dennison, & Hill, 2006) and stress, anxiety, and depression were found to be the most important barriers in adherence to a healthy lifestyle and to hypertension control (Khatib et al., 2014).

It was found that 28% of the hypertensive and 45% of the normotensive participants held the misconception that the psychological symptoms of neglecting high BP, include anger, tensions and hyper-behavior. This finding shows that improving knowledge about hypertension is necessary for dismantling the commonly held misconceptions about the condition.

The study participants were found to have good lifestyle related knowledge, regarding the condition of hypertension. The importance of a healthy diet intake, low in saturated fats, salt, cholesterol, and oil as well as the avoidance of junk and fried food was correctly recognized by 33% the hypertensive and 29% of the normotensive participants, as instrumental in effective hypertension control and management. Cultural practices, traditions, and beliefs have been found to strongly influence what individuals eat (Krugger, Puoane, Senekal, & Van Der Merwe, 2005; Witten, Vuuren, & Learmonth, 2013) and it has been seen that robust social traditions and practices, increase the difficulty of instilling a long term behavior change, of healthier eating styles (Witten, Vuuren, & Learmonth, 2013).

Yoga, meditation, breathing exercises like Pranayama, and laughter therapy were accurately identified, as important stress management techniques, by 32% of the hypertensive and normotensive participants in our study sample. This finding is consistent with previous research which has shown that programs in stress management techniques were found to significantly improve hypertension control outcomes (Giuse, Koonce, Storrow, Kusnoor, & Ke, 2012). A recent study conducted among 97 Hong Kong Chinese individuals, showed that attending a yoga training program thrice a week for a year, resulted in significant reductions in blood pressure levels among study participants as compared to those in a control group (Supriya et al., 2018).

Having a positive outlook towards life and being happy were considered as essential, in mitigating the risk of developing hypertension and improving hypertension control, by 12% of the hypertensive and 13% of the normotensive participants. This finding is consistent with previous studies, that have shown that incorporating positive affect induction and the use of small gifts and bimonthly phone calls, to help patients incorporate positive thoughts in their daily routine to foster self-affirmation, was effective in enhancing anti-hypertensive medication adherence (Ogedegbe et al., 2012). A dysfunctional style of thinking that characterizes rumination, and that comprises of thinking about the causes and consequences of stressful events, and self-focused cognitive processing of negative life events, has been found to lead to anger, negative mood states (Kross, Ayduk, & Mischel, 2005), and elevated blood pressure levels (Kross & Ayduk, 2008; Spruill, 2010). The conceptualization

that happiness results in the optimal control of hypertension, is resonant with previous findings which have shown that happier nations have a lower prevalence of hypertension, as compared to those that score lower on the happiness index. Happiness seems to have an impact on hypertension development, through its association with well-being, which correlates inversely with hypertension onset and management, leading to happier nations having fewer incident cases of high blood pressure (Blanchflower & Oswald, 2007). India has been ranked 118th in the United Nations world happiness index, and has a hypertension prevalence rate of around 25% to 30% in urban areas, and 10% to 20% in rural areas accounting for 57% of all stroke deaths and 24% of all coronary heart disease deaths (Gupta & Gupta, 2017; Anchala et al., 2014; Gupta, 2004; Subramanian, Soudarssanane, Jayalakshmy, Thiruselvakumar, Navasakthi, Sahai, & Saptarishi, 2011).

Spiritual orientation, religiosity, and detachment from worldly affairs, were perceived by 12% of the hypertensive and 8% of the normotensive respondents, as being instrumental in the optimal management of the condition of hypertension. This conceptualization is consistent with previous findings that religion and spirituality, facilitate the optimal control of blood pressure levels (Manshaee & Amini, 2013) and that church based hypertension behavioral modification programs which use spirituality and religion as a source of emotional and social support, were successful in instituting health behavior change resulting in optimal hypertension control among church members (Dodani, Beayler, Lewis, & Sowders, 2014).

Although the hypertension related functional knowledge among both the hypertensive and normotensive participants was found to be inadequate, it was observed that the hypertensive patients had considerably better knowledge and lower number of misconceptions in this domain. The consequences of missing medication, were undermined by 20% of the hypertensive and 31% of the normotensive participants in our study, who felt that missing anti-hypertensive medication for a few days, will not result in any adverse health consequences. This finding closely resonates with a study which showed that among the 42% of the urban and 25% of the rural Indians who were aware of their hypertensive status, only 38% of the urban and 25% of the rural Indian population were being treated for their condition with only 20% of the urban and 10% of the rural Indian population having their BP under control (Anchala et al., 2014). The adverse consequences of missing medication can be life-threatening, and could result in serious health complications such as heart disease, stroke, paralysis, and renal failure.

Certain misconceptions held by the hypertensive and normotensive participants, warrant serious attention by health care providers. The misconception that anti-hypertensive medication can be stopped, when a patient's hypertension comes under control, was held by 20% of the hypertensive and 36% of the normotensive respondents. This finding closely corresponds with the report of the World Health Organization, which posits that non-compliance to medication is the main cause of uncontrolled hypertension, with nearly three fourths of the hypertensive patients having uncontrolled BP levels (World Health Organization, 2000).

A meta-analysis of 28 studies from 15 countries showed that approximately 45% of hypertensive patients were non-adherent to anti-hypertensive medication and 84% of those with uncontrolled hypertension were found to be non-adherent to their prescribed medication regimen (Abegaz, Shehab, Gebreyohannes, Bhagavathula, & Elnour, 2017). Anti-hypertensive medication adherence was found to be determined by social, psychological, physical, and economic factors (Akintunde & Akintunde 2015). Previous studies have shown that hypertensive patients do not fear the consequences of discontinuing their medication, are more apprehensive of the heavy financial burden imposed by their prescribed treatment regimen, and felt that achieving hypertension control meant that there was no more reason to use their anti-hypertensive medication (Oke & Bandle, 2004).

Scientific evidence has indicated that improved knowledge about the disease, recognizing the importance of medication adherence, positive attitudes, and health seeking behaviors were facilitating factors to medication adherence and hypertension control whereas a new diagnosis of hypertension, lack of knowledge about the condition, increasing numbers of medications and dose frequencies as well as expensive prescribed costs of medicines were barriers to treatment compliance and effective hypertension control. Low rates of adherence to anti-hypertensive medication, has been found to result from patients health beliefs, that hypertension is incurable, anti-hypertensive medication is unnecessary, that there are adverse side-effects of medication, and lack of personal control over stressful life events (Mpinda, Tumbo, Govender, & Mills, 2014; Horne, Clatworthy, & Polmear, 2001).

The use of traditional medicines instead of allopathic medication was suggested by 14% of the hypertensive and 11% of the normotensive participants. This finding is dismal in light of the fact that decreased treatment compliance, has been shown to be associated with beliefs of hypertensive patients, that traditional or herbal medicines are useful in controlling hypertension (Mpinda, Tumbo, Govender, & Mills, 2014; Eisenberg et al., 1998; MacLennan, Wilson, & Taylor, 1996; Eddouks, Marghrani, Lemhadri, Ouahidi, & Jouad, 2002; Astin, 1998; Amira & Okubadejo, 2007). Previous studies have shown that community health workers, who do not have an accurate understanding of the risk factors of hypertension (Sengwana & Puoane, 2004), and who advocate for traditional medicines such as natural herbs and home-brewed beer, over western medicine as the ideal and preferential treatment for hypertension, can have an adverse impact on hypertension related health

outcomes in a community (Witten, Vuuren, & Learmonth, 2013). Patient's incorrect health beliefs and misconceptions about the condition of hypertension, were found to contribute to their poor understanding of the condition, and influenced their interpretation and response to hypertension (Mpinda, Tumbo, Govender, & Mills, 2014).

Several incorrect health beliefs were held by both the hypertensive and normotensive participants regarding the condition of hypertension. The health beliefs of hypertensive patients regarding their condition, were found to significantly influence management and control of the condition, and have been found to act as facilitators or barriers to optimal hypertension control, having a direct bearing on quality of life outcomes (Mpinda, Tumbo, Govender, & Mills, 2014).

In accordance with the tenets of the Health Belief Model, hypertensive patients who perceived greater susceptibility to the health related complications of their condition, enhanced severity of their condition, and recognized the benefits of medication adherence were found to be more adherent to anti-hypertensive medication than those who did not (Kamran, Ahari, Biria, Malpour, & Heydari, 2014). Perceived barriers to anti-hypertensive medication adherence, were found to be strong predictors of non-compliance with the treatment regimen (Wai et al., 2005; George & Shalansky, 2007), and were found to be rooted in health beliefs and attitudes towards healthcare (Lewis & Ogedegbe, 2008) as was evidenced in previous studies. Positive beliefs and attitudes towards medication adherence (Hadi & Gooran, 2004), recognizing the dangers of non-adherence, and strong beliefs regarding the importance of medication adherence (Rajpura & Naik, 2014), were found to significantly predict improved treatment compliance among hypertensive patients.

Scientific evidence highlights the need to educate and correct the gross misconceptions, held by individuals regarding the various aspects of the condition of hypertension, by means of patient counseling and health promotion programs (Oke & Bandele, 2004; Mpinda, Tumbo, Govender, & Mills, 2014).

V. Conclusion & Implications

Knowledge about hypertension among both the hypertensive and normotensive participants was found to be inadequate. Although several misconceptions about hypertension were held by the study participants, hypertensive participants were found to possess better knowledge and a lower number of misconceptions about their condition as compared to the normotensive participants.

The implications of our study are manifold. Firstly, health education programs and interventions need to be implemented in schools, colleges, workplaces, communities, and primary care facilities to improve knowledge and awareness about the condition of hypertension and to dismantle misconceptions and incorrect health beliefs rooted in long-standing cultural and social values, traditions and practices. Secondly, the government and health care providers need to provide affordable anti-hypertensive medication, and accessible primary care treatment to socio-economically disadvantaged groups, to mitigate the health, social and financial costs of treating the complications of hypertension for individual families and the health care system. Thirdly, screening for hypertension, patient education, and counseling given at primary care centers can facilitate the early detection, diagnosis, treatment, and control of the condition. Fourthly, utilizing the services of community health workers like the Accredited Social Health Activist in door to door screening for hypertension, and regular counseling on the importance of anti-hypertensive medication adherence, and lifestyle modifications can lead to improved BP control and management rates in a community. Fourthly, based on the qualitative responses obtained from the study participants, development of a hypertension knowledge scale for assessment purposes seems logical. Fifthly, the design of health promotion interventions, utilizing the principles of the health belief model, social cognitive theory, and the transtheoretical model of behavior change can effectively mitigate the risk factors of hypertension by enhancing knowledge, thereby facilitating positive health behavior change and suitable lifestyle modifications among community members.

A major strength of the study is its relatively large sample size of 199 participants, which greatly enhances its generalizability and application value. Also the qualitative enquiry facilitated the generation of rich and in-depth data from the study participants.

However, there are certain limitations of the study. Firstly, the study sample was selected through the method of purposive sampling, leading to a certain degree of bias. Secondly, there may be differences in the knowledge levels of participants, based on socio-demographic variables such as age, gender, and socio-economic status which have not been investigated in the current study.

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