Original Article

Association between Knowledge and Drug Adherence in Patients with Hypertension in Saudi Arabia

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Abstract

Purpose: The aim of this paper is to determine the association between the knowledge of hypertension management and drug adherence for patients with Hypertension in Saudi Arabia. **Method:** The research involves a cross-sectional study in which 198 high-blood pressure patients from several (27) hospitals in seven Saudi Arabian cities: Riyadh, Dammam, Alahsa, Alqatif, Makkah, Jeddah, and Taif, were surveyed. A questionnaire, which was divided into three sections – demographic data, hypertension knowledge questions, and medication adherence, was used to collect data on how aware are the patients of managing hypertension. Descriptive statistics were utilized to determine patient's demographic attributes and Spearman rank correlation was used to evaluate the relationship between disease familiarity and medication adherence. **Results:** Out of the 198 patients surveyed, about 58.08% (115 patients) were within the poor knowledge category; while, 132 (66.67%) were categorized as moderate adherent to medication. Only 15 (7.58%) patients were considered as being good adherents to hypertensive medication. The correlation coefficient between overall score of knowledge and that of medication adherence was -0.1889 ($\rho<0.001$), suggesting a converse relationship between overall knowledge cores and the level of medication adherence. **Conclusion:** While the scores of knowledge were overall poor, the patients were not sure of the benefits associated with continuous use of medication which leads to non-adherence to treatment regimens. Enlightening patients regarding the importance and associate gains of hypertensive medication and expounding on any doubts with regards to the use of drugs should lead to better treatment and management of hypertension.

Keywords: drug/medication adherence, knowledge/information, hypertension

Introduction

Hypertension is considered among the fatal diseases that leads to death and has become a public health problem globally. Hypertension, also called high blood pressure leads to severe health complications such as heart diseases and mortality [1]. Blood pressure refers to the force that the blood exerts on blood vessels, and it depends on how hard the heart has to work and the resistance of blood vessels. It is therefore, essential that patients having this condition be aware of the importance of drug adherence.

The aim of this research is to determine the link between understanding of what hypertension is, how to manage it, and medication attitude and adherence among patients in Saudi Arabia. There is a concern that most of the patients in this country do not follow the drug prescription given to them by the doctors [2]. It harms the treatment of the disease, which leads to deaths that can get prevented. The main reason for the lack of adherence to drugs is the lack of knowledge on the importance of medication. Hypertension is considered to be

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a severe medical condition that should be treated with at most care to ensure there are no further complications such as heart attacks or bursting of the blood vessels.

There has been a lot of research on the issue of knowledge and medical adherence, despite the fact that hypertension is a leading health burden in Saudi Arabia. It exposes an individual to conditions such as heart attack, stroke chronic kidney diseases, heart failure, and vascular diseases [1, 3, 4]. Some of the factors exposing individuals to the disease include urbanization, aging, obesity, excessive intake of salts, and a sedentary lifestyle. It is therefore, vital to increase the awareness and knowledge of hypertension detection, control, and treatment among the people, especially on the dangers of uncontrolled blood pressure. Globally, hypertension affects almost 1 billion people, with 40% of those affected being aged 25 years and above [5-10]. It is per a report released by World Health Organization (WHO) that blood pressure accounts for 9.4 billion deaths each year due to stroke (51%) and heart disease (45%) worldwide [8].

Lifestyle modification and pharmacotherapy provide the main methods for the management and control of hypertension. Medical adherence also plays a crucial role in obtaining the desired medical results. Medical adherence can be defined as the extent to which an individual follows the drugs, diet, and the necessary lifestyle changes in correspondence with the given instructions by a medical practitioner. A lot of research has shown a relationship between medication adherence and the control of blood pressure. Failure to follow medication leads to severe psychosocial and medical complications. It also increases healthcare costs and reduced health-related quality of life.

Saudi Arabia is struggling in the control of hypertension and the provision of adequate healthcare for its people. Hypertension is among the most predominant non-communicable diseases in the country and is estimated to be the leading cause of death. It is estimated that one in every four adults aged between 15-64 years has hypertension [11]. There is a lot of documentation on hypertension among people living in Saudi Arabia. Studies have indicated that 63% of patients suffering from hypertension in the country have their blood pressure not controlled, which is a high number [5, 12-14]. However, there is not enough research on the adherence to drugs for blood pressure patients, especially those in a primary care situation. It is therefore, essential to study the extent of medication adherence and the factors influencing adherence considering that hypertension gets managed with primary care. It will ensure that the necessary measures of control are put into practice in the primary health care setting to improve patient adherence to medication. It will also prevent the long-term negative repercussions of non-adherence and hence reducing the strain in secondary healthcare settings. It can be achieved by providing the patients with the necessary information and knowledge on the issue of drug adherence. Learning can get spread through educating the people on the need to ensure that they adhere to the medication given to them.

Several studies indicate that patients with the knowledge of hypertension, including those with the experience of their blood pressure, have better adherence to medication [10]. However, there is no consistency in the correlation between the number of people with vital knowledge about hypertension and control of their blood pressure. A study carried out in Saudi Arabia in 2013 did not indicate any significant relationship between patients is knowing their target blood pressure and controlling their blood pressure [15]. Several factors can be related to poor control of blood pressure. The most common one is the level of education about hypertension, health system factor, physician inertia to treat targets, non-adherence, and lack of antihypertensive medication, all of which have been reported in Saudi Arabia. Also, a lot of hypertension studies have been done in rural and urban areas with very little information on patients living in pre-urban regions [11].

Materials and Methods

This study was carried out in three regions in Saudi Arabia, namely the Middle, Eastern, and Western regions. It was conducted in the cities of Riyadh, Dammam, Alahsa, Alqatif, Makkah, Jeddah, and Taif, and a total of 27 hospitals were used in the study. A questionnaire with three distinct sections was used to collect data about the relationship between knowledge and understanding of hypertension and medication adherence in hypertensive patients. The first section of the questionnaire was that of demographic characteristics where patients were required to fill information about their gender, and age. The age was divided into various parts for those between the age of 18-25, 26-35, 36-45, 46-60, and those aged 61 and above. The second section of the questionnaire was meant to assess the patients' knowledge of hypertension; this was done using Hypertension Fact Questionnaire, abbreviated as HFQ. The patients were required to answer 15 questions to indicate whether or not they were aware of the causes of hypertension, its treatment, as well as management. Their response to each of the questions in this section was scored as either 'yes', 'no', or 'not sure'. The design of the HFQ provided for a scoring range of 0 (minimum) to 15 (maximum), where a score less than 7 was considered poor, between 7 and 11 was considered as average, and between 12 and 15 was considered as adequate knowledge of hypertension. Individual knowledge scores of the participants were summed up to determine the overall knowledge score.

The third section of the questionnaire was that of drug adherence questions intended to assess the patient's adherence level to hypertensive medication. Here the patients were required to indicate whether the positives of medical adherence out the way the negatives and whether they feel uncomfortable with medication, among other questions. It is important to mention that the assessment instrument used for the drug adherence section was Medication Adherence

Measure (MAM-10) which consisted of 10 assessment items. The questions used in the questionnaire required dichotomous responses (yes/no, true /false) to avoid acquiescence bias. MAM provided for a scoring range of -10 (minimum) to 10 (maximum), in which scores in the negative were considered to imply non-adherence, those between 0-5 as moderate adherence, while 6-10 were considered to imply complete adherence. The survey, especially the instruments, was revalidated by pretesting it in another medical study that consisted of 20 patients having hypertension.

The study was cross-sectional research whereby the patients were selected based on convenience sampling. The questionnaire was given to the patients attending a family medical clinic after receiving informed consent. A total of 198 patients were involved in the study, and the participants had to be diagnosed with hypertension and attending the medical clinic, which was the inclusion or exclusion criteria. They also had to be above the age of 18. The data obtained in the questionnaire was then transferred to an excel sheet for further statistical analysis. Spearman's rho test was used to evaluate the relationship between hypertension understanding and medication adherence. Those patients that met the criteria for inclusion were required to fill a consent form. For this study, the objective of knowledge and adherence to hypertension medication was according to the NICE guidelines of 2011 for hypertension in adult patients.

In the study, observations were made in the hospitals where patients with hypertension were mainly were taken care by nurses with referral to the doctor for the review of their blood pressure in case it was uncontrolled or complications arose. The data source was twofold with clinical information about the patients obtained from the hospitals' records. The other data was obtained from the questionnaire. Ethical permission was also obtained from the biomedical research ethics committee of Saudi Arabia. All patients involved in the study signed a consent form after receiving information that they would participate in the study. Hypertension was diagnosed with values of SBP/DBP > 140/90 mmHg, measured with the use of a mercury sphygmomanometer.

RESULTS

Demographics of the patients; surveyed

MAM-10 and HFQ were initially pre-tested with 20 established hypertension patients to assess their validity and reliability (0.65 for MAM-10 and Cronbach $\alpha = 0.70$) for use in this study. Table 1 shows the attributes of the patients in this study, including the frequency distribution data of the study. According to the analysis done on MS Excel, the average patients' age was 35.65 years, 57.6% of which were males and 42.4% were females.

Table 1: Attributes of the patients surveyed

Characteristics	Frequency	Percentage
Age (35.65)		
18-25	40	20.20
26-35	35	17.68
36-45	39	19.70
46-60	44	22.22
61 and older	40	20.20
Gender		
Male	114	57.58
Female	84	42.42

Hypertension knowledge scores

The responses from the patients with regard to HFQ section of the questionnaire are presented in Table 2 in a descending order. As noted earlier, HFQ scores ta the range of minimum of 0 to a maximum of 15. The overall mean score, out of the 198 patients, was 4.02, which fell within the poor knowledge category. In fact, about 58.08% (115 patients) of all the patients surveyed in this study were right within the poor knowledge category. 80 patients, about 40.40%, showed moderate understanding of hypertension, and only 3 patients (1.52%) displayed adequate understanding of hypertension. Poor understanding was apparent with regards to responses to question 3, 4, and question 5, which were associated with onset of the disease and its overall management, as well as with regard to questions 11, 12, and question 13, which were concerned with dietary management of hypertension. In fact, the correct responses to these questions, as illustrated in Table 2 were 39.90, 39.9, 37.88, 38.38, and 39.39 %, respectively. Correct responses were the highest for questions 1, 7, 14, and 15, at 42.93, 43.94, 45.96, and 41.92%, respectively.

Table 2: The responses to hypertension knowledge facts

Hypertension Knowledge Items	Yes (%)	No (%)	Not Sure (%)
Do you know the normal values of blood pressure?	42.93	38.38	18.69
Elevated BP is called hypertension	37.88	42.93	19.19
Hypertension is a condition which can progress with age	39.90	40.91	19.19
Both men and women have equal chance of developing hypertension	33.33	45.45	21.21
Hypertension is a treatable condition	41.92	39.90	18.18
The older a person is, the greater their risk of having hypertension	42.42	35.35	22.22
Smoking is a risk factor for hypertension	43.94	37.37	18.69
Eating fatty food affects blood cholesterol level which is a risk factor for developing hypertension	41.41	37.37	21.21
Being overweight increases risk for hypertension	37.88	45.45	16.67
Regular physical activity will lower a person's chance of getting hypertension	37.88	39.39	22.73
Eating more salt has no effect on blood pressure	39.39	41.41	19.19
Dietary approaches to reduce hypertension do no good	41.92	38.38	19.70
White meat is as good as red meat in hypertension	42.93	39.39	17.68
Medication alone can control hypertension	35.35	45.96	18.69
Hypertension can lead to other life-threatening diseases	41.92	40.40	17.68

Drug adherence outcomes

Table 3 shows the answers from the surveyed patients with regard to the medication adherence questions as evaluated by MAM-10 scale. The scoring range of MAM-10 test was 10 for maximum and -10 for minimum. An analysis of the data in MS Excel indicated that the overall mean score was 2.27, with the median score being 2. Out of the 198 patient's surveyed, 51 (25.76%) patients were classified as being poor adherents, and 132 (66.67%) categorized as moderate adherent to their medication. Only 15 (7.58%) patients were considered as being good adherents to hypertensive medication. The results indicate that poor adherent to hypertensive medication was with regards to the answers given to questions 2, 3, and 6, in which the correct responses made up 41.92, 41.41, and 43.94%, respectively. The right responses, 65.15, 62.63, and 64.14%, were the highest with regards to questions 1, 4, and 8, respectively. As earlier indicated, Spearman's rho between the overall score with regard to familiarity with the disease and overall drug adherence was determined to be -0.1889 ($\rho<0.001$) suggesting that there is a strong converse relationship between the scores for knowledge of the disease and the medication adherence levels.

Table 3: The data for medication adherence

Medication adherence item	True (%)	False (%)
For me, the good things about medication outweigh the bad	65.15	34.85
I feel uncomfortable on medication	58.08	41.92
I take medications of my own choice	58.59	41.41
Medications make me feel more relaxed	62.63	37.37
Medication makes me feel tired and sluggish	56.57	43.43
I take medication only when I am sick	56.06	43.94
I feel more normal on medication	59.09	40.91
It is unnatural for my mind and body to be controlled by medication	64.14	35.86
My thoughts are clearer on medication	58.08	41.92
By staying on medications, I can prevent getting sick	56.06	43.94
For me, the good things about medication outweigh the bad	65.15	34.85
I feel uncomfortable on medication	58.08	41.92
I take medications of my own choice	58.59	41.41

Discussion

Hypertension is one of the most widespread non-communicable diseases globally; however, it is unfortunate that the control of illness is somewhat suboptimal. While the patients, as the results of this study indicate, had poor knowledge with regards to hypertension, the drug adherence level was moderate. With regards to the Saudi Arabia population, of which this study was based, the impact of the knowledge that patients have with regards to the disease on medication adherence is still not certain given the fact that there was not any past research focused on Saudi Arabia on this subject that can be compared to this present study. Nevertheless, studies that have been carried out in other countries and regions such as in UAE and n Pakistan have indicated very mixed responses. In this research, the patients' understanding of the disease had an inverse correlation with medication adherence.

Evidence suggests that understanding, information and knowledge can have an impact on the patient's level of medication adherence. There are various studies that have found and supported this correlation; for instance, studies by [16-18] found a positive association between knowledge and medication adherence. Researches that evaluate elements in efficacious medication adherence do not show awareness and understanding as one of the significant impacting factors in achieving good medication adherence [17]. However, there are also certain studies that highlight knowledge as being associated with medication adherence, although only under certain circumstances, context, and conditions [16]. Contrastingly, some other studies exist which have found absolutely no correlation between knowledge and medication adherence [18].

Clearly, there are conflicting opinions and findings with regard to the relationship between knowledge and medication adherence. The clear reasons for these conflicts might be as a result of the definition and concept of knowledge and adherence. There are times that the impact of other factors cannot be disregarded since medication adherence is a multifaceted phenomenon and the failure or success of therapy does not depend on one factor. There are other factors including gender, socioeconomic status, age, types of medication prescribed, posology, societal support, patient-health provider relationship, cost, as well as psychological challenges must be considered and measured before arriving at a conclusion regarding the level of medication adherence [1].

In a more comprehensive context of ensuring optimal healthcare – medicine or drug administration- one aspect emphasizes the individual understanding of the disease by patients, disease management, and eventual treatment. This increases the possibilities of exercising more control over the condition of the illness. In the present study, a majority of the surveyed patients did not clearly comprehend the illness they were suffering from. In fact, they did not have enough information on treatment of the disease, as well as on the management of the disease. Apparently, as asserted by [18], there seems to be no established collaborative system or process for managing this disease; in fact, major and essential stakeholders in the healthcare system still continue to squabble over duties, which in turn affects patient care services. In this regard, the interaction between the patient and a healthcare professional is quite limited, which might be one of the reasons explaining poor medication adherence. This implies that it is just about time that healthcare facilities and professionals adopted patient-centered approach to healthcare services provision; this approach will ensure that a patient is involved in the process of making decisions regarding their health.

Another patient care aspect concerns the health belief model (HBM), which asserts that individual beliefs and attitudes can explicate the health attributes and behaviors of such an individual [16]. According to HBM, perceived barriers and benefits in the treatment routine play a crucial part in attaining healing success. In this present research, patients apparently made autonomous evaluations regarding their illness, including its management and treatment, and were also utilizing different healthcare systems from different areas. Thus, this might possibly be another explanation for the lack of adherence to treatment since varying views from different healthcare systems, as well as from other sources, might make the issue more complex for the patient. It is however important to mention that some of these healthcare alternatives are not officially approved by relevant authorities, and as such their influence is only prominent within the population. Additionally, it is important that the issue can be investigated by medical and social researchers in order to get a comprehensive appreciation of the challenges. Furthermore, the findings of such studies must be used in decision-making by the concerned parties in the healthcare system.

Conclusion

The success of treatment regimens, particularly with regards to hypertension, is dependent on the level of adherence by a patient to medication. There has always been the belief that knowledge is an integral facet when it comes to achieving better medication adherence. Nevertheless, it was found in this study that knowledge was inversely correlated in this study's cohort. This study also showed that there were conflicting and confusing information and perception regarding the usage of drugs. Healthcare professionals, apparently, have a significant role to play in this respect, and as such, a collaborative healthcare framework should be adopted since it would promote and enable the education of patients regarding the importance of hypertension medication, as well as the significance of continuous drug use. This is with respect to the therapy and management of protracted illnesses. Additionally, studies have also shown and emphasized the importance of identifying the key contributing factor to non-adherence to hypertensive medication.

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