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Factors Affecting Antihypertensive Treatment Adherence: A Saudi Arabian Perspective

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Abstract Hypertension is a global health issue among the adult population. Adherence to antihypertensive medications is an effective step for better control of blood pressure and preventing the risk of complications. Several factors support or hinder hypertensive patients' adherence. Objectives: This article reviews the factors affecting adherence to antihypertensive treatments, and reflects on these factors from a Saudi Arabian perspective. Methods: Papers and studies about antihypertensive medication adherence were reviewed from different databases including MEDLINE, PubMed, ScienceDirect and Google scholar. Results: Factors affecting antihypertensive treatments adherence are classified into three domains: Patient (e.g. sociodemographic, individual knowledge and skills), Health System, and Provider related factors.

Keywords Antihypertensive Treatment, Adherence, Saudi Arabia

1. Introduction

Hypertension is defined as raised systolic or diastolic blood pressure equal to or more than 160/95 mmHg according to the World Health Organisation[1]. Hypertension has become a significant health problem in both developing and developed countries. Risk factors associated with the development of hypertension are family history, advanced age, gender, a lack of physical activity, poor diet (especially salty food), overweight and obesity, and increased alcohol intake[2-4].

In 2002, the WHO reported that approximately 20% of the world's adult population, approximately one billion people, are estimated to have hypertension, which contributed to more than 7.1 million deaths per year[4]. The report stated that the prevalence has dramatically increased in patients older than 60 years in a variety of countries, with 50% of individuals in this age group having hypertension.

Hypertension is also a common health problem in Saudi Arabia, where the prevalence is increasing. Previous studies in Saudi Arabia have estimated the prevalence of hypertension at 26.1% among adults aged 30–70 years[5].

Adherence to antihypertensive medication is an effective step for controlling blood pressure and preventing complications. However, certain factors affect a hypertensive patient's behaviour regarding adherence to antihypertensive treatments. These factors can support or hinder adherence behaviour. From the available research in the field of hypertension treatment, factors influencing hypertensive patients' adherence behaviour to antihypertensive medication include patient-related factors (e.g., socio-demographic factors and the individual's knowledge and skills), health system-related factors (such as treatment cost and patients' resources), and provider-related factors (such as patient-provider relationships and communication).

Hypertensive patients in Saudi Arabia were reported to have low adherence to their antihypertensive treatments. In attempting to understand reasons for low adherence, studies in Saudi Arabia have focused on only a single factor. Holistically addressing all relevant factors, i.e. those related to patients, health systems, and providers, would therefore be a significant step in shaping the future of hypertension research in Saudi Arabia, and would hopefully point to changes and interventions that need to be made to improve adherence behaviour among hypertensive patients.

2. Materials and Methods

Papers cited in MEDLINE, PubMed, ScienceDirect and Google scholar databases were searched using the following keywords: Saudi Arabia, hypertension, antihypertensive, treatments, adherence and adult. A total of 44 relevant articles were found. Articles including information about secondary hypertension and children were excluded from this review. The initial focus was on articles that studied antihypertensive treatments adherence in relation to different factors in the general population. Several studies showed the relationship between single factor and antihypertensive treatments adherence in adults. The second

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step involved searching for papers that focused on factors influencing adherence among Saudi Arabian patients. Factors influencing adherence were then classified into three domains: patient, health system and provider-related factors.

3. Literature Review

Factors Affecting Antihypertensive Treatment Adherence

To understand the reasons for low adherence to antihypertensive treatments among hypertensive patients, various factors are classified in this paper as patient, health system and provider related factors.

3.1. Patient-Related Factors

According to the literature, individual factors affecting antihypertensive treatment adherence include socio-demogr aphic factors, individual's knowledge and skills, personal beliefs and perceptions, and physical and mental ability of hypertensive patients.

Socio-demographic Factors

Numerous studies have investigated the association between hypertensive patients' socio-demographic factors and their adherence to treatment regimens. For example, older patients report high adherence to antihypertensive regimens and better knowledge of their condition than younger patients[6]. Interestingly, it was also found that males are more adherent than females but are less consistent in taking medication[7]. One study found that females from poor socio-economic status and with low educational level were more likely to have low antihypertensive treatment adherence. Males with a similarly low level of education who were also from the same socio-economic class had higher antihypertensive treatment adherence[8]. The interpretation of this result is that less educated females in lower classes are more liable to devote their time to their families instead of taking care of themselves. No similar study conductedin investigating the role of socio-demographic factors in relation to patients' adherence to antihypertensive treatments in Saudi Arabia.

Individual's Knowledge and Skills

There is positive relationship between patient's levels of knowledge of treatment and better adherence[9]. It was found that 43.7% of patients believe that antihypertensive drugs can be stopped once the blood pressure has stabilized. This shows how the lack of knowledge about treatment contributes to patient low adherence behaviour. Patients cannot necessarily be blamed for this as studies[9-11] have shown that patients' poor knowledge about medication is often related to the effectiveness of the health education they receive.

Some research in Saudi Arabia has been conducted to study the adherence practices of hypertension patients. These studies aimed to investigate patients' adherence and knowledge of hypertension[12], patients' treatment practices[13] and hypertension control[14]. The key findings included lack of patients' knowledge about hypertension[12], patients' hypertension practices need to change by improving their diet and life style to enhance their quality of life[15], low awareness of hypertension and also poor control of blood pressure and the use of its treatment[14]. Despite this, the main strength of these studies is that they were conducted using large sample size. The limitation of these studies is the data collection methods employed. For example, a study has investigated hypertensive patients practice by using the WHO stepwise approach to surveillance (STEPS) of no communicable disease risk factors[13]. However, the contents of this survey were created to be used to collect country-wide information about chronic disease risk factors rather than focusing on particular patients' practices[16]. Therefore, further research is required in this area using a specifically designed tool to explore Saudi hypertensive patients' adherence behaviour.

Individual's Beliefs and Perceptions

Patients' adherence to treatment often improves when they have positive beliefs about the efficacy of the treatment the take and trust that their treatment is working well to control their illness[17, 18]. However, believing that treatments are not important or harmful is a barrier to adherence[19]. Patients' beliefs about medical management and drugs in particular are driven by their knowledge. For example, some hypertensive patients hold the belief that taking antihypertensive treatments will result in side effects[12]. Cultural background also influences patients' beliefs about medication. A study of Chinese immigrants with hypertension living in the United States of America found they are lower adherent to antihypertensive treatments. In this case adherence is influenced by the perceived benefits of Chinese herbs in controlling patients' blood pressure, and western medications for hypertension were shown to be perceived as less beneficial[20]. Some religious beliefs contribute to patient practices regarding taking medications. For example, the Islamic faith supports the notion of taking what is beneficial for health to prevent harm and Muslim patients therefore take medication to manage and overcome illness. However, some Muslims from low socioeconomic backgrounds with a poor level of education might misunderstand this religious concept. This is the case for participants in a study conducted by Griffith and colleagues who stated that they were non-adherent to antihypertensive treatments among Muslims Bangladeshi patients because of the belief that their illness is predetermined from God (Allah) and therefore they are not required to intervene with treatment[21].

Physical and Mental Ability

Studies that address the role of physical and mental abilities and how they influence treatment adherence are rare. Physical, mental and sensory abilities, such as auditory or visual impairments, can have a negative impact on adherence[22]. One physical factor that can affect treatment adherence relates to the presence of co-morbidities. Patients with multiple health conditions receive different types of

therapies. However, it was found that an increase in the number of drugs being taken is not associated with poor adherence to antihypertensive treatments in one of the studies[23]. This is because patients with co-morbidity who receive multiple medications consider the seriousness of their health condition[23].

Psychological impairment also influences poor health outcomes[24]. Psychological conditions such as stress, fear and anxiety are linked to poor treatment adherence[25]. This is because patients experiencing these conditions are often unable to properly manage their conditions. In addition, the risk of low adherence to antihypertensive treatment is higher among patients who feel ashamed, guilty and dissatisfied regarding their non-adherence[25]. On the contrary, patients who are aware of the negative impact of stress show better adherence to antihypertensive medications[26], which supports the significant role of knowledge in treatment adherence[9].

3.2. Health System Related Factors

The quality of the healthcare system is also an important factor that can help or hinder patients' adherence to treatments. In terms of hypertension management, the healthcare system is inclusive of policies, resources, and financial arrangements that determine the quality of medical services, for example, physician skills.

Guidelines for Management and Policy

Hypertension guidelines consist of standardised information developed to enable healthcare practitioners to provide the best practices in terms of prevention, early detection and management of hypertension. All existing guidelines for hypertension management derived from WHO international recommendations and recent evidence-based research emphasise high quality of care[1].

Various hypertension management guidelines have been devised and distributed worldwide in order to improve the control of hypertension. Recommendations concerning screening, diagnosis and treatment of hypertension are contained in these guidelines. Following evidence from clinical trials, the guidelines for management of hypertension recommend certain classes of drugs for treating hypertension with and without co-morbidities. These drugs serve as the baseline in daily medical care when assessing the quality of pharmacotherapy[27].

A number of studies have investigated the quality of hypertension management in Saudi Arabia. These studies considered physician adherence to the hypertension management guidelines[28] and the quality of hypertension management in primary care settings[29]. Valuable findings include deficiencies in physicians' practices, poor hypertension control and the absence of an electronic patient record system revealed. Howeverresults from these studies are questionable they were local and evaluated only one primary healthcare centre[29] or were limited by a small sample size[30].

Barriers identified for physicians not adhering to the clinical guidelines are classified into three themes that include physicians' knowledge (lack of awareness, familiarity), attitudes (disagreement, outcome expectancy or lack of activity) or physicians' behaviour. Barriers present in one setting may not be present in another, therefore assessing these in different settings barriers is important in improving adherence to guidelines[31].

Quality of Healthcare Services

The quality of the healthcare system plays a role in patients' adherence practices. For example, the availability of a well-established system of keeping patient records is critical in tracking adherence[32]. Recording information about patients' regular follow-ups, current condition, the frequency of medication refills and the date of the last refill all are important in tracking patients' adherence and therefore in preventing complications via initiating suitable interventions for low adherent patients[32]. A cross-sectional study in Saudi Arabia that aimed to identify the management practices of hypertensive patients by evaluating patients' records showed poor recording of information, such as smoking status, any family history of cardiovascular disease and patients' body mass index (BMI). The study findings show that only a quarter of the 201 hypertension cases studied were sufficiently controlled[30]. Another study evaluated 120 patients' records from two healthcare centres in Saudi Arabia based on the Quality Assurance Guideline introduced by the Saudi Ministry of Health. The data revealed that 63% of hypertensive cases were well controlled, 50% had good compliance with appointments and only 9% suffered from hypertension-related complications[33]. The most important finding was that providers' hypertension management practices are not in accordance with the recommended national standard of care. Providing higher quality of care is associated with better hypertension control and the prevention of complications[34].

Cost of Treatment

The costs of medications have an inverse relationship with treatment adherence. It was reported that higher medication costs result in lower overall healthcare costs that in turn result from increased use of more expensive medications to treat chronic conditions, such as hypertension, diabetes mellitus, hypercholesterolemia and heart failure[35].

Cost-related issues consider as a possible reason for patients failing to respond to pharmacotherapy. In cases whereby the patient's health does not improve due to the underuse of medication because of its cost, a common response of a physician is to increase their dosage, or add augmentation therapy, which is unlikely to improve outcomes[36]. Physicians should be familiar with the costs of drugs for their patients. One study found that costs increased in cases where the guidelines were not adhered to. This finding suggests that more expensive drugs were prescribed instead of cheaper drugs, such as diuretics, as a first line treatment[37].

Prices of antihypertensive medications in Saudi Arabia are affordable and range from 1 US$ and $\leq$ 30 US$ according to the published Saudi Hypertension Management Guidelines that provided the list of the

available oral antihypertensive agents in Saudi Arabia and the pricing list for these drugs[38]. However, most residents of Saudi Arabia (and the Gulf region in general) receive free health care. Prescription medication from governmental hospitals and primary health care clinics is also provided at no cost[39, 40]. Community pharmacies are also available and provide drug products available for purchase for households to supplement their medication requirements. There are >3000 community pharmacies in Saudi Arabia alone. The majority of these pharmacies are located in the regions of Riyadh and Jeddah[40].

However, with this privilege of receiving free cost therapy, patients' adherence behaviour in relation to free drug cost is unknown, and the assumption should not solely hypothesise that free drug cost is associated with increasing patients' adherence, because the adherence practice is influenced by different contextual factors other than drug price.

Patient Resources

Patient resources are those provided by the healthcare system to enhance patients' treatment practices, for example, written patient education materials and patient education sessions. Compared to no active intervention, the effect of printed educational materials appears to be minor and the clinical significance is uncertain[41]. The outcome of providing patient resources is increased patient knowledge and support. An integrated and community-based comprehe nsive intervention programme for health promotion and non-communicable disease prevention was successful in the United Arab Emirates (UAE) for dealing with diseases that were diet related. The programme addressed primary, secondary and tertiary prevention levels[42].

In Saudi Arabia a study conducted in 15 primary health care centres in Al-Qassim province in 2009 showed that health education interventions were successful in making changes in the lifestyle of chronic patients[43].

3.3. Provider Related Factors

According to the available studies, provider related factors in relation to antihypertensive medication adherence include provider-patient relationship and communication. No studies conducted in Saudi Arabia were found reporting on the influence of provider-patient relationship or communication in relation to antihypertensive medication adherence.

Provider-patient relationship

The quality of the therapeutic relationship between patients and healthcare providers defined in terms of the level of satisfaction and degree of autonomy patients experience when they deal with healthcare providers[44]. Patient satisfaction concerning the healthcare provided to them is an indication of a good patient-physician relationship. Researchers have found that the level of patients' satisfaction has a positive effect on their adherence to taking the requisite medication; however satisfaction level is difficult to be measured[45-47]. Patients who are unsatisfied with their relationships with their healthcare providers may perceive that the healthcare environment is not therapeutic. This may then result in lower levels of adherence to taking the requisite medication due to a lack of patient empowerment[48].

Provider-Patient Communication

Interestingly, there is a large volume of published studies describing the role of physician-patient communication in enhancing patients' adherence to medication[48-50]. The outcome of 'patient-centred' communication between patients and health care providers is that it contributes to increase patients' understanding about their illnesses and adherence to treatments. This based on the provided support from health care providers.

Although the interpersonal communication process in the patient-physician relationship has a potentially positive impact on patients' health outcomes, physicians usually do not ask their patients about medication-taking behaviour or may use ineffective communication approaches[49]. It is argued that non-collaborative communication on the part of healthcare providers result in poor patient adherence to antihypertensive treatments[50]. In Saudi Arabia, attention has been drawn towards enhancing healthcare team communication skills in order to improve patients' health outcomes. The impact of enhanced health education programs about health knowledge and behaviour (lifestyle modification) of patients with chronic conditions provided valuable results in improving patients' adherence to taking medication[43].

4. Conclusions

This paper has reviewed and critically analysed different factors of hypertensive patients' adherence to antihypertensive treatmentswhich include factors related to hypertensive patients themselves (e.g. sociodemographic factors, individuals knowledge and skills), health system related factors (such as treatment cost and patients resources), and provider related factors (such as the relationship with patients and communication).

The available studies in Saudi Arabia show that hypertensive patients report insufficient knowledge about hypertension and its management, and low hypertension control. In addition physicians report low adherence to hypertension management guidelines. Further research is required investigating Saudi hypertensive patients' adherence behaviour, and the influence of patient, health system and providerrelated factors on antihypertensive treatment adherence among this population.

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