Research Paper

Health Literacy and Its Association With Medication Adherence in Patients With Hypertension: A Mediating Role of Social Support

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ABSTRACT

Objectives: This study aimed to investigate the predictive relationship between medication adherence in light of health literacy and social support, in addition to differences in medication adherence according to different demographic characteristics.

Methods: In this cross-sectional descriptive study, 450 hypertensive patients visiting primary care facilities in Babil Governorate were included. A questionnaire including sociodemographic information, the Morisk medication adherence scale, the social support rating scale, and the health literacy management scale were used in this study. Data were collected and SPSS software, version 20 was used for analysis after ensuring the validity and reliability of the study tools.

Results: The findings showed that social support (74.9%) and treatment adherence (75.6%) were at a low level, whereas health literacy (67.8%) was at a high level. Health literacy (β=-0.708; P=0.001) and social support (β=0.220; P=0.001) were predictive factors for medication adherence. Based on gender, marital status, educational attainment, monthly income, and the length of hypertension, the results showed statistically significant differences in the level of medication adherence (P=0.001).

Discussion: Enhancing medication adherence in hypertensive patients is essential. The level of health literacy and social support directly and indirectly affect treatment adherence. Therefore, these aspects should be considered as effective interventions to improve medication adherence in this group of individuals suffering from chronic diseases.

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Highlights

- Health literacy and social support are important factors that affect medicine adherence. While social support seems to increase medication adherence rates, health literacy appears to have the opposite impact, lowering such adherence.

- In order to better manage hypertension and increase drug adherence rates among these patients, improvements in health literacy and social support for patients are necessary.

Plain Language Summary

Hypertensive patients frequently disregard instructions on how to take their prescribed drugs. In addition, these patients struggle with a lack of social support and have significant health literacy issues. While both social support and health literacy are crucial for improving treatment compliance, patient medication compliance is positively impacted by social support and it is negatively impacted by health literacy. Furthermore, there are variations in adherence levels between genders, married and single individuals, university graduates and non-graduates, and those with higher monthly incomes. Additionally, the length of hypertension positively affects patients' compliance

Introduction

Hypertension, one of the most common chronic conditions, plays a significant role in global cardiovascular and public health mortality [1]. Several studies suggest that a variety of risk factors may exacerbate hypertension, increasing the risk of strokes, heart attacks, and kidney failure. Some risk factors are unchangeable, such as gender, age, and family history [2]. However, certain modifiable risk factors include smoking, poor dietary habits, excessive alcohol consumption, physical inactivity, obesity, high cholesterol levels, and diabetes [3]. The disease pattern in Iraq, as well as in other countries in the region, has shifted due to the rising incidence of non-communicable diseases. The most common cause of death in Iraq, according to national data registries, is still cardiovascular illnesses. According to statistics, it accounts for up to half of all sickness cases and one-third of all fatalities [4]. The nationwide diabetes and hypertension screening program was progressively extended to all primary healthcare facilities, including all 100 of Iraq's health directorates, beginning in 2008. The screening system identified 860,000 cases of high blood pressure between the project's initiation and 2017, with 150,000 cases confirmed [4]. Every human being has the fundamental right to health, and obtaining health requires having a suitable level of health knowledge and comprehension [5]. In many regions of the world, people struggle with health literacy because they cannot properly comprehend health information or follow treatment recommendations. This can exacerbate health issues in individuals with chronic illnesses, leading to a worsening of their conditions [6]. Social support appears to be a crucial factor in enhancing health literacy and improving medication adherence rates in such situations [7]. Patients with a strong social support system are better equipped to follow their treatment plans and develop skills related to health literacy [8]. Additionally, social support can provide guidance and educate patients, encouraging their active participation in self-care [9, 10]. One of the chronic illnesses for which a patient's health depends on ongoing adherence to therapy is hypertension. The rise in these chronic illnesses necessitates a solid grasp of health and the capacity to successfully engage with health information. People with these diseases face significant challenges when it comes to health literacy [11]. "Health illiteracy" refers to the inability to understand and use health knowledge to make informed decisions about one's health [12]. In many Iraqi communities, a lack of health literacy can exacerbate chronic illnesses, lead to injuries, and result in delays in receiving essential medical care. Individuals with long-term conditions like hypertension require close monitoring and must adhere to their doctor's instructions and prescription schedules consistently [13]. The goal of science and research should be to comprehend health literacy and how it affects hypertension patients' adherence to their medication. People with low health literacy may be more likely to forget to take their medications on time or misinterpret health instructions, which can worsen their condition and place additional strain on the healthcare system [14, 15]. Social support is a crucial component that can assist patients with low health literacy in improving their medication adherence. Social support from friends, family, and the local community can significantly enhance adherence to medication and healthy behaviors. Those who are more health literate can better absorb health information when they have the support of their social network [10].

The importance of medication adherence for individuals with hypertension cannot be overstated, since it is crucial for the management and control of this chronic condition. Hypertension is one of the main risk factors for cardiovascular diseases, such as heart attacks and strokes. Regular follow-up consultations with nurses, lifestyle modifications, and continuous adherence to prescribed drug regimens are crucial for the management of hypertension [16]. Patients who disregard their prescriptions face the danger of experiencing the negative effects of high blood pressure, which include damage to vital organs, such as the heart, kidneys, and blood vessels. Additionally, uncontrolled hypertension increases the cost of hospital and primary care treatments, which puts an additional burden on the healthcare system [16]. In order to better understand the relationship between medication adherence and health literacy in patients with hypertension, this study assessed the role that social support plays as a mediating factor in this relationship. We looked at the factors that influence medication adherence and how social support can help patients stick to their treatment plans and stay healthier overall.

Materials and Methods

Study design

This study followed the descriptive cross-sectional design since it is the best suitable method to accomplish its goals.

Study sample

A total of 450 participants with a diagnosis of hypertension who visited primary healthcare facilities in the Babylon Governorate were chosen as a non-probability convenience sample. Given that 25% of the research population has high blood pressure and because 1,803 visits to those health centers were made in a given month, this sample was chosen in part because of these factors.

The 25% of the study population is represented by selecting a quarter of the monthly visits for patients with hypertension.

Study tools

A questionnaire was utilized as the research tool, focusing on investigating the social and demographic characteristics of the individuals in the research sample. These characteristics encompassed various aspects such as age, gender, educational level, monthly income, occupation, and duration of hypertension. Specific metrics were employed in this study to analyze the collected data and information, including:

The Morisky medication adherence scale (MMAS-8), which comprises eight items and its Arabic version has been validated, was used to measure adherence to antihypertensive drugs [17]. In our study, its Cronbach's α was 0.87, showing strong reliability in this particular setting.

The social support rating scale (SSRS) was used to assess patients' social support, and its Arabic version has been validated [18]. This scale's Cronbach's α in this study was 0.79, indicating a satisfactory level of reliability.

Health literacy was assessed using the health literacy management scale (HeLMS), which was developed by Jordan et al. [19] and its Arabic version has been validated [20]. The scale's Cronbach's α in this study was 0.87, indicating improved reliability.

Validity and reliability

Experts in the field of nursing evaluated the questionnaire for validity, and a pilot study was carried out on 20% of the research population to assess the instrument's reliability. The researcher asked the participants to fill out a questionnaire with their comments in order to participate in the study after introducing themselves to them when they visited the primary health care centers. Subsequently, the investigator elucidated the study's goals and title in order to assess the comprehensibility and simplicity of reading the questionnaire's contents. The estimated time for completing each form was 20 minutes, and the pilot study was excluded from the sample without modification following data analysis. The study scales' intraclass correlation coefficient (ICC) was 0.86, which denotes strong stability.

Data collection

The actual data collection process spanned nearly a month, during which the researchers conducted individual interviews with each study participant at primary healthcare facilities.

These interviews involved explaining the study's objectives and obtaining verbal consent from each participant. Patients who met specific criteria, including having a hypertension diagnosis for more than six months and providing voluntary consent, were interviewed to gather information. The confidentiality of collected data and the privacy of participants were rigorously maintained. Participants were under no obligation to continue or discontinue their participation at any point in the study.

Statistical analysis

All statistical analyses were performed using SPSS software, version 20. Numeric values and percentages were used to rank the variables, while Mean±SD were employed to provide statistical descriptions of continuous variables. A straightforward linear regression test was employed to evaluate the hypothesis of the relationship between the study's variables. The distribution of data was assessed using two common techniques: The Kolmogorov-Smirnov and Shapiro-Wilk tests. Additionally, the Mann-Whitney U and Kruskal-Wallis H tests were performed to assess any statistical differences between the groups. A significance threshold of 0.05 was applied.

Results

The mean age of participants was 47.61±14.84 years, with ages ranging from 22 to 74 years. Regarding gender, hypertension was more prevalent among females (54.7%) followed by males (45.3%). Concerning marital

Table 1. Sociodemographic characteristics

Factors	Classification	No. (%)
Age (y)	20-29	91(20.2)
	30-39	42(9.3)
	40-49	80(17.8)
	50-59	104(23.1)
	60<	133(29.6)
	Min-max	22-74
	Mean±SD	47.61±14.84
Gender	Male	204(45.3)
	Female	246(54.7)
Marital status	Single	83(18.4)
	Married	219(48.7)
	Divorced	100(22.2)
	Widow	48(10.7)
Education level	Illiterate	61(13.6)
	Primary school	267(59.3)
	Secondary school	38(8.4)
	College	84(18.7)
Monthly income level	Low	58(12.9)
	Medium	96(21.3)
	High	296(65.8)
Duration of hypertension (y)	<1	242(53.8)
	1-3	107(23.8)
	>3	101(22.4)

Table 2. Frequency of samples by their overall variables

Variables	Levels	No. (%)
Morisky medication adherence scale	Low	340(75.6)
	Moderate	73(16.2)
	High	37(8.2)
Social support rating scale	Low	337(74.9)
	Moderate	84(18.7)
	High	29(6.4)
Health literacy management scale	Low	53(11.8)
	Moderate	92(20.4)
	High	305(67.8)

Table 3. Simple liner regression for social support and health literacy to predict medication adherence

Variables	Unstandardized Coefficients		Standardized Coefficients	t	P
	B	Std. Error	Beta		
Social support	0.232	0.035	0.220	6.565	0.001
Health literacy	-0.633	0.030	-0.708	-21.174	0.001

Dependent variable: Medication adherence; Independent variables: Health literacy and social support.

status, the majority were married (48.7%) and concerning education level, more than half of the studied sample had completed primary school (59.3%). Approximately one-third of the study sample did not have enough monthly income (65.8%). In terms of the duration of the disease, 53.8% were diagnosed with hypertension for less than one year.

The results in Table 1 revealed the socio-demographic characteristics of the participants in which the mean age was 47.61±14.84 years and ages ranged from 22 to 74 years. Relevant words for this essay may appear in purple. With respect to gender, hypertension was more common among females (54.7%) and the rest were males (45.3%). On the status on marital the married ones were majorities (48.7%). The related findings on education level, the majority of the studied sample were primary school graduates (59.3%). One-third of the respondents (65.8%) had low monthly income. With regard to duration of disease, (53.8%) were diagnosed with hypertension for less than one year.

Table 2 displays that 75.6% of patients with hypertension had low drug adherence. Additionally, 74.9% of hypertension patients reported receiving little social support, while 67.8% of these patients reported being highly illiterate in terms of health. The data given in Table 2 demonstrate the poor medication adherence rate (75.6 %) among patients with hypertension. Further, social support provided to patients with hypertension was also low (74.9%). In addition, health literacy in patients with hypertension was recorded a high level (67.8%) (Figures 1 and 2).

Table 3 presents the findings from a simple linear regression statistical analysis indicating that the degree of health education (β=-0.708; P=0.001) and the existence of social support (β=0.220; P=0.001) are predictive factors for medication adherence in hypertension patients.

According to Table 4, there were statistically significant differences in medication adherence among hypertensive patients based on their gender, marital status,

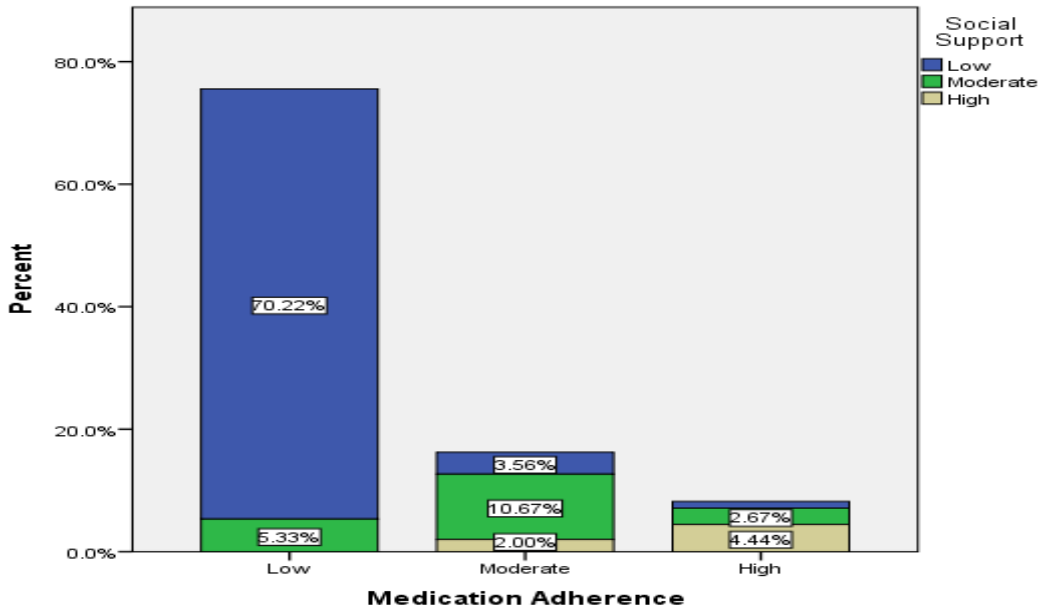

Figure 1. Social support and compliance with medication

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education level, monthly income, and duration of hypertension (P=0.001 for all variables).

Discussion

Medication adherence is a crucial aspect of managing and treating hypertension, as it plays a vital role in maintaining cardiovascular health. Patients with hypertension experience elevated blood pressure in their arteries, which can have significant adverse effects on their well-being and increase the risk of cardiovascular diseases. It is imperative to emphasize to patients the importance of improving medication compliance, as treating hypertension with medication helps stabilize blood pressure, thereby reducing the risk of cardiovascular diseases.

According to the study's findings, 75.6% of participants had low medication adherence, indicating that medication adherence is highly suboptimal among hypertension patients. This is concerning since there is a connection between a higher risk of cardiovascular disease and its complications with non-adherence to antihypertensive treatment [21]. Inadequate medication adherence has consequences that extend beyond individual health out-

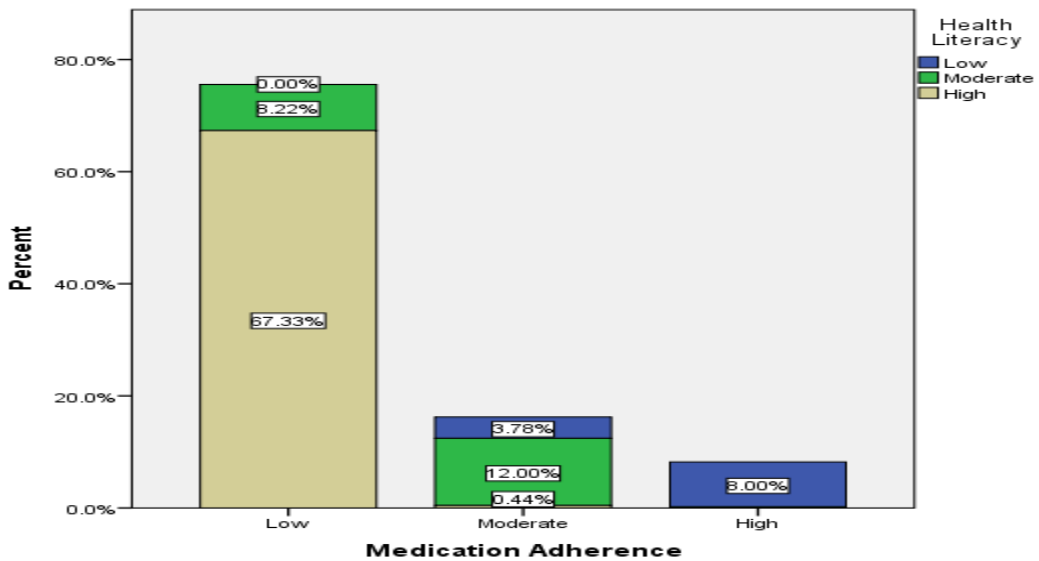

Figure 2. Health literacy and compliance with medication

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Table 4. Differences in the medication adherence regarding patients' socio-demographic characteristics

Morisky Medication Adherence Scale	Categories			Mean Differences	P
	Groups	No.	Mean Rank		
Age (y)	20-29	91	214.97	2.169	0.705
	30-39	42	217.37		
	40-49	80	234.16		
	50-59	104	229.27		
	60<	133	227.11		
Gender	Male	204	241.69	21789.500	0.001
	Female	246	212.08		
Marital status	Single	83	176.14	112.441	0.001
	Married	219	275.47		
	Divorced	100	174.63		
	Widow	48	188.85		
Education level	Illiterate	61	180.66	58.321	0.001
	Primary school	267	217.32		
	Secondary school	38	203.11		
	College	84	294.21		
Occupation	Employed	38	214.33	4.925	0.177
	Non-governmental	51	203.97		
	Retired	129	221.93		
	Unemployed	232	234.05		
Monthly income level	High	58	330.45	168.091	0.001
	Medium	96	292.68		
	Low	296	183.15		
Duration of disease (y)	<1	242	176.70	133.762	0.001
	1-3	107	270.85		
	>3	101	294.39		

comes and affect the overall cost burden of hypertension on public health systems. Enhancing medication adherence is a primary goal of interventions aimed at reducing the potential consequences of poorly controlled hypertension.

These findings are in line with those of the Al-Khobar study and lower than those of the Saudi Arabian study [22, 23]. Discrepancies in adherence rates could be attributed to variations in healthcare systems, demographics, and tools used to measure medication adherence.

The study highlights the low levels of medication adherence rates and inadequate social support received by people with hypertension, with 74.9% reporting low levels. People with chronic illnesses need social support for self-care since it affects their motivation and ability to adhere to prescribed medication schedules and other healthy behaviors [24]. The low levels of social support reported by patients underscore the necessity for nurses and the community to offer interventions aimed at strengthening social support networks for individuals with hypertension. Some potential tactics include educational programs that inform friends and family about the illness, how to support it, and why it is crucial. These findings are in line with studies conducted in the Iraqi province of Babylon, which revealed that most patients with chronic conditions and illnesses needing rehabilitation do not obtain the necessary level of social assistance [10].

Additionally, the study sheds light on the issue of health illiteracy among hypertension patients, as 67.8% of them exhibited high levels of this knowledge deficit. Health literacy is a critical component when it comes to helping individuals with hypertension comprehend medical information, make essential decisions regarding medication adherence, and navigate healthcare systems successfully [25]. Insufficient health literacy can hinder the effective management of hypertension, leading to inadequate self-care practices and deteriorating overall health. Addressing health literacy through targeted educational initiatives and readily available health communication resources is essential for enabling individuals with hypertension to make informed decisions about their health and medication adherence.

The research emphasizes the various difficulties that people with hypertension encounter, such as poor medication compliance, insufficient social support, and elevated levels of health literacy. These results highlight the necessity of all-encompassing interventions that deal with the disease's social, educational, and health-related aspects. Medication adherence among hypertensive patients should be encouraged through social support interventions provided by health care facilities (nurses), and increasing health literacy is crucial to improving patient outcomes and lowering the overall burden of hypertension on public health.

Social support vs medications adherence

Research has shown that social support is crucial for promoting medication compliance in individuals with long-term hypertension. The positive beta value (β=0.220) indicates a direct correlation between social support and medication adherence. This suggests that patients with high levels of social support networks are more likely to adhere to their prescribed medication regimens with a 0.220 increase in adherence for each incremental rise in social support. These findings demonstrate the extent to which emotional and practical support has a favorable impact on adherence habits, supporting the idea that social support is important in the management of chronic illnesses [26]. Additionally, social cognition theory, which holds that people learn by seeing and interacting with others, has supported the impact of social networks on behaviors related to health [27]. In the context of medication adherence, this may involve sharing experiences, acting as reminders, or providing assistance with medication administration in a socially supportive environment.

Health literacy vs medication adherence

The negative beta coefficient (β=-0.708) of health literacy indicates a negative relationship between health literacy and adherence to medication prescribed for hypertension patients. This suggests that for every unit improvement in health literacy, patients with hypertension have a 0.708-fold decrease in drug adherence. This finding is consistent with other studies emphasizing the significance of health literacy in understanding and applying medical guidance for chronic illnesses [28, 16]. Understanding and adhering to prescription instructions, possible side effects, and the significance of following pharmaceutical guidelines might be significantly hampered by high level of health literacy [29]. Patients with hypertension may find it challenging to absorb complicated medical information, which can result in misinterpretations and a disregard for recommended treatment plans. Therefore, it is critical to suggest initiatives aimed at enhancing health literacy in order to promote chronic condition medication adherence, including hypertension [30].

Differences in medication adherence according to patients' characteristics

The results demonstrated that there were statistically gender-based differences in hypertension patients' adherence to their medications (P=0.001). The results showed that males followed their hypertension treatment plans more religiously than women did. These findings are consistent with those of Radhi et al. [16]. Gender differences in adherence underscore the importance of developing intervention strategies that consider gender differences to address specific medication management needs.

Marital status can also influence medication adherence in patients with hypertension. The results showed a significant difference (P=0.000) in medication adherence levels between married patients and their single, divorced, and widowed counterparts. This observation can be attributed to the concept that shared responsibilities, spousal (social) support, and a more stable social environment positively impact the adherence of married individuals to their prescription regimens [31].

Another remarkable finding among the key factors affecting medication adherence in patients with hypertension is educational attainment. The results demonstrated that patients with different educational backgrounds adhere to treatment at significantly different rates (P=0.000), with college graduates adhering to treatment at the greatest rates. This underscores the critical role of health literacy. These differences may be explained by the fact that individuals with higher education levels may possess greater health awareness, understand the importance of following hypertension medication regimens, and have better relationships with community health nurses [32].

According to statistical analysis, patients with higher (sufficient) monthly incomes exhibited better medication adherence (P=0.001). This indicates a significant difference in adherence levels based on monthly income. Increased monthly income may facilitate more consistent adherence to blood pressure medication, underscoring the importance of targeted interventions for patients with lower incomes to address potential barriers to following their prescription drug regimens as prescribed [16].

The study results indicated statistically significant differences (P=0.001) in medication adherence levels based on the length of hypertension. These differences favored individuals with longer histories of hypertension, who demonstrated higher medication adherence than those with shorter durations. This observation suggests that individuals with a longer history of hypertension may have developed stronger medication adherence habits or possess a heightened awareness of the importance of consistent care [33].

Conclusion

The study's striking finding is that individuals with hypertension exhibit low medication adherence, limited social support, and a high level of health illiteracy. Among the predictive factors for medication adherence, health literacy, and social support emerge as significant contributors. The complexity of this issue is underscored by the significance of variables such as patients' gender, marital status, educational attainment, monthly income, and duration of hypertension. To address these concerns, interventions by community health nurses should prioritize strengthening patients' social support networks and enhancing their health literacy levels.

Study limitation

Many patients declined to participate in the study due to time constraints, unwillingness, or lack of interest in the research. Additionally, the extensive questionnaire and large sample size made data collection a labor-intensive process.

Ethical Considerations

Compliance with ethical guidelines

This research approved by the Ethical Committee of Al-Awsat Technical University (No.: 713, dated 3/11/2023).

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Authors' contributions

Conceptualization and data analysis: Mohammed Malih Radhi; Data collection, writing and supervision: All authors.

Conflict of interest

The authors declared no conflict of interest.

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