

Assessment of Medication Adherence in Patients with Chronic Diseases in Tabuk, Kingdom of Saudi Arabia

Kousalya Prabahar, Maymonah Abdullah Albalawi, Lama Almani, Sarah Alenizy

Department of Pharmacy Practice, Faculty of Pharmacy, University of Tabuk, Tabuk, Saudi Arabia

ABSTRACT

Objective: Uncontrolled chronic diseases such as hypertension and diabetes mellitus can lead to severe complications. Poor adherence to medication is one of the important reasons, leading to complications for chronically diseased patients. We aimed to assess the trend toward medication adherence and the reasons for medication nonadherence in chronic disease patients in Tabuk city in Saudi Arabia. **Methods:** A cross-sectional study was conducted at a tertiary care hospital in Tabuk, Saudi Arabia. Participants were selected and interviewed for information regarding their medication adherence. A medication adherence rating scale questionnaire was used to measure the level of adherence in study participants. The data were analyzed by the statistical package for the social sciences (SPSS) database 24. **Findings:** Overall, 208 participants were involved in this study. Among these, 134 (64.4%) were female, and 74 (35.6%) were male. This study showed that 159 (76.44%) participants were adherent to their medications and nearly one-quarter of patients were nonadherent to their medications. No statistically significant differences were found between male and female patients toward their medication adherence. The primary intentional and nonintentional reason for nonadherence was side effects and forgetfulness, respectively. **Conclusion:** Tailoring the therapy according to the individual need of the patients will maximize the patient's adherence toward medications.

KEYWORDS: *Diabetes mellitus, hypertension, medication adherence, nonadherence*

Received: 31-07-2020.
Accepted: 17-09-2020.
Published: 11-01-2021.

INTRODUCTION

Medication adherence is taking medications as prescribed and recommended by health-care professionals who administer these prescription courses for a particular duration. Diabetes mellitus (DM) and hypertension (HTN) are the most prevalent chronic diseases in Saudi Arabia.^[1] HTN is a condition of having elevated blood pressure above a systolic pressure of 140 mmHg or a diastolic pressure of 90 mmHg. HTN can lead to increased hospital admission due to complex complications such as cardiac morbidity and mortality due to uncontrolled levels of blood pressure.^[2] DM is a condition arising due to a higher increase in blood sugar levels due to a reduction in the insulin level of the body.^[3] Chronic hyperglycemia and other metabolic diseases related to DM lead to potential long-term

complications including retinopathy, cardiovascular (CV) diseases, neuropathy, nephropathy, and diabetic foot disorders. Chronic diseases can lead to disability and death.^[4] Medication adherence is important to control chronic disease. Adherence to medication was found to be higher than adherence to change of lifestyle.^[5] The extent to which a patient does not take medicines as prescribed is called nonadherence.^[6] Nonadherence to medications can be divided into unintentional or intentional medication nonadherence. Unintentional nonadherence is a passive process, in which the patient may be forgetful or careless to the treatment regimen. Intentional nonadherence is an active process in the

Address for correspondence:

Dr. Kousalya Prabahar, E-mail: kgopal@ut.edu.sa

Access this article online

Quick Response Code:



Website: www.jrpp.net

DOI: 10.4103/jrpp.JRPP_20_97

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Prabahar K, Albalawi MA, Almani L, Alenizy S. Assessment of medication adherence in patients with chronic diseases in Tabuk, Kingdom of Saudi Arabia. *J Res Pharm Pract* 2020;9:196-201.

patient's choice of a treatment regimen.^[7] The main concern of poor adherence is associated with a serious drug-related problem and may lead to increased emergency-room visits, hospitalizations, and suboptimal clinical outcomes.^[8] Medication nonadherence with hypertensive patients leads to severe complications and it increases the chance of CV problems. Beta-blockers and lipid-lowering agents are the most commonly prescribed drugs in hypertensive patient, and it has been reported that low adherence to these agents increases the risk of death in hypertensive patients. The nonadherence rate of antihypertensive drugs such as captopril and quinapril also noted to increase the risk of CV complications.^[9]

Tabuk is a region of Saudi Arabia, located along the North-West coast of the country. Even though many studies have been conducted on assessing medication adherence in chronic diseases in Saudi Arabia, less studies have been conducted in Tabuk region. Moreover, prevalence for HTN and diabetes at Tabuk was assessed and found that the prevalence rate is higher than most cities in Saudi Arabia.^[10] Hence, we mainly focused on these two chronic disease population to make this study unique and of particular relevance. The main problem of nonadherence in Kingdom of Saudi Arabia (KSA) in the long-term treatment remains poor due to the patient's beliefs, regimen's dissatisfaction, and the unfavorable side effects of prescribed medications. Therefore, we conducted this study to assess medication adherence in chronic disease patients in Tabuk, a city in the KSA. The main objectives of this study were to evaluate the trend toward medication adherence and the reasons for medication nonadherence in patients in a tertiary care hospital.

METHODS

A cross-sectional survey-based study including 208 participants from a tertiary care hospital at Tabuk, Saudi Arabia, was conducted during the period of 4 months, after getting patient's consent. Male and female participants >18 years of age, having DM, HTN, or both were included in the study. Participants who are not willing to participate in the study were excluded.

We used simple random sampling method for patient enrollment, and the sample size was calculated by with a confidence level of 95% and margin of error 5%. This study was approved from the Research Ethics Committee (UT-107-10-2020). This survey was conducted using medication adherence rating scale (MARS) questionnaire.^[11] MARS questionnaire contains only ten questions, which does not take much of patient's time. Moreover, this questionnaire is generalized, validated with Cronbach's alpha of 0.77,

and internal consistency reliability of $\alpha = 0.75$. It satisfactorily predicts nonadherence and can be widely used in all population groups and chronic diseases. The survey consisted of two parts. The first part contains demographic information that includes gender, age, and participant's medical condition; either they have HTN, DM, or both. The second part contains the MARS questionnaire, which is a 10-item self-reporting multidimensional instrument describing three dimensions: medication adherence behavior (items 1–4), attitude toward taking medications (items 5–8), and adverse side effects and attitudes to medication (items 9–10).^[12] Each question was explained to the patients, and their response was recorded. The questionnaire composed of ten closed-ended questions with either yes or no answer. The questions were explained to the patients, and their response was recorded. The MARS score was calculated such that compliant patient responds "No" to questions 1-6, 9-10, and "Yes" to questions 7 and 8. The scores of 6 and above indicate that the patients are adherent to medications.

Data were analyzed by the statistical package for the social sciences (SPSS) Armonk, NY: IBM Corp. database version 24. Descriptive statistics were used to summarize findings with mean and standard deviation values reported for continuous variables and frequencies and percentages for categorical variables. Pearson's correlation was used to test the association between adherence level and age, gender, and medical condition.

RESULTS

To achieve the objectives of the study, 208 participants were involved in the study, where 134 (64.4%) were females and 74 (35.6%) were males. The mean \pm STD age of patients was 48.95 ± 13.14 years. Most of them had DM only (94, 45.2%), while 79 participants (38%) had both DM and HTN, and only 35 participants (16.8%) had HTN only. The study results showed that 159 (76.44%) participants were adherent to their medications.

Table 1 represents the commitment of patients toward their medications. One hundred and eighty-one patients (87%) stated that their thoughts are clearer on medication. About 166 patients (79.8%) stated that they are not careless at times about taking their medication, and 164 patients (78.8%), even if they feel better, they do not stop taking medication.

Table 2 illustrates the correlation between gender and their trend toward medication commitment. The results did not show any statistical differences between male and female patients toward their medication commitment status ($P > 0.05$).

Table 1: Participants trends toward medication commitment

Parameter	Yes, N (%)	No, N (%)
Do you ever forget to take your medication?	115 (55.3)	93 (44.7)
Are you careless at times about taking your medication?	42 (20.2)	166 (79.8)
When you feel better, do you sometimes stop taking your medication?	44 (21.2)	164 (78.8)
Sometimes if you feel worse when you take the medication, do you stop taking it?	63 (30.3)	145 (69.7)
I take my medication only when I am sick	36 (17.3)	172 (82.7)
It is unnatural for my mind and body to be controlled by medication	56 (26.9)	152 (73.1)
My thoughts are clearer on medication	181 (87.0)	27 (13.0)
By staying on medication, I can prevent getting sick	111 (53.4)	97 (46.6)
I feel weird on medication	50 (24.0)	158 (76.0)
Medication makes me feel tired	91 (43.8)	117 (56.3)

Table 2: Correlation between gender and trend towards medication commitment

	Gender, N (%)		P
	Male	Female	
Do you ever forget to take your medication?			
Yes	41 (55.4)	74 (55.2)	0.980
No	33 (44.6)	60 (44.8)	
Are you careless at times about taking your medication?			
Yes	16 (21.6)	26 (19.4)	0.703
No	58 (78.4)	108 (80.6)	
When you feel better, do you sometimes stop taking your medication?			
Yes	13 (17.6)	31 (23.1)	0.347
No	61 (82.4)	103 (76.9)	
Sometimes if you feel worse when you take the medication, do you stop taking it?			
Yes	19 (25.7)	44 (32.8)	0.282
No	55 (74.3)	90 (67.2)	
I take my medication only when I am sick			
Yes	16 (21.6)	20 (14.9)	0.222
No	58 (78.4)	114 (85.1)	
It is unnatural for my mind and body to be controlled by medication			
Yes	19 (25.7)	37 (27.6)	0.763
No	55 (74.3)	97 (72.4)	
My thoughts are clearer on medication			
Yes	65 (87.8)	116 (86.6)	0.794
No	9 (12.2)	18 (13.4)	
By staying on medication, I can prevent getting sick			
Yes	37 (50.0)	74 (55.2)	0.470
No	37 (50.0)	60 (44.8)	
I feel weird on medication			
Yes	19 (25.7)	31 (23.1)	0.681
No	55 (74.3)	103 (76.9)	
Medication makes me feel tired			
Yes	35 (47.3)	56 (41.8)	0.443
No	39 (52.7)	78 (58.2)	

Table 3 illustrates the correlation between medical condition and their trend toward medication commitment. The results showed statistically significant differences between patients in relation to their medical condition toward their commitment level in related to certain items ($P \leq 0.05$). These include patients can prevent getting sick

by taking medications (DM patients show the highest agreement), patients feel weird on their medication (Both DM and HTN patients show the highest agreement), and medication makes patients feel tired (HTN patients show the highest agreement).

In Table 4, the correlation between age of patients and their trend toward medication commitment was depicted.

Table 3: Correlation between medical condition and trend towards medication commitment

	Medical condition, N (%)			P
	DM	HTN	Both	
Do you ever forget to take your medication?				
Yes	46 (48.9)	22 (62.9)	47 (59.5)	0.233
No	48 (51.1)	13 (37.1)	32 (40.5)	
Are you careless at times about taking your medication?				
Yes	13 (13.8)	10 (28.6)	19 (24.1)	0.099
No	81 (86.2)	25 (71.4)	60 (75.9)	
When you feel better, do you sometimes stop taking your medication?				
Yes	17 (18.1)	8 (22.9)	19 (24.1)	0.610
No	77 (81.9)	27 (77.1)	60 (75.9)	
Sometimes if you feel worse when you take the medication, do you stop taking it?				
Yes	24 (25.5)	15 (42.9)	24 (30.4)	0.163
No	70 (74.5)	20 (57.1)	55 (69.6)	
I take my medication only when I am sick				
Yes	12 (12.8)	7 (20.0)	17 (21.5)	0.285
No	82 (87.2)	28 (80.0)	62 (78.5)	
It is unnatural for my mind and body to be controlled by medication				
Yes	28 (29.8)	11 (31.4)	17 (21.5)	0.382
No	66 (70.2)	24 (68.6)	62 (78.5)	
My thoughts are clearer on medication				
Yes	87 (92.6)	29 (82.9)	65 (82.3)	0.097
No	7 (7.4)	6 (17.1)	14 (17.7)	
By staying on medication, I can prevent getting sick				
Yes	63 (67.0)	14 (40.0)	34 (43.0)	0.002
No	31 (33.0)	21 (60.0)	45 (57.0)	
I feel weird on medication				
Yes	15 (16.0)	11 (31.4)	24 (30.4)	0.046
No	79 (84.0)	24 (68.6)	55 (69.6)	
Medication makes me feel tired				
Yes	32 (34.0)	23 (65.7)	36 (45.6)	0.005
No	62 (66.0)	12 (34.3)	43 (54.4)	

DM=Diabetes mellitus, HTN=Hypertension

Accordingly, no statistically significant differences were found between age level and trend toward medication commitment, except one: “careless at times about taking their medication,” where patients with higher age were susceptible to be more careless at times about taking medications ($P < 0.05$).

Patients with higher age groups were slightly higher than lower age group patients in their agreement toward forgetting to take medication; stop taking medication when they feel better; and complaining that medication makes them feel tired.

DISCUSSION

Control of diabetes and HTN represents a significant challenge and requires attention to both nonpharmacological and pharmacological treatment. However, medication adherence makes up an essential factor in maintaining optimal blood pressure and blood glucose. Nonadherence to treatment remains a serious

problem. It has many deleterious effects on the effect of health care. Increasing medication adherence improves the health of the population, especially patients with chronic diseases.^[13]

In our study, 115 patients (55.3%) stated that they forget to take their medication. This is in accordance with other study.^[4] Our study results show that patients with higher age were susceptible to be more careless at times about taking medications ($P < 0.05$). It is in contrast to other study which reported that patients of younger age were significantly associated with decreased adherence.^[14] These findings are supported by reports among patients suffering from various illnesses.^[15-17] Other study reported that more severely ill older patients were more attentive to their treatment regimen because they were more aware of their own mortality compared to younger patients.^[18]

Furthermore, our study showed that 91 participants (43.8%) feel fatigued after taking their

Table 4: Correlation between patient's age and trends towards medication commitment

Age of patients and their commitment toward items	Mean±SD		P
	Yes	No	
Do you ever forget to take your medication?	49.73±13.12	48.00±13.16	0.346
Are you careless at times about taking your medication?	54.61±12.42	47.52±12.96	0.002
When you feel better, do you sometimes stop taking your medication?	50.36±13.67	48.57±13.01	0.425
Sometimes if you feel worse when you take the medication, do you stop taking it?	48.77±13.29	49.03±13.11	0.897
I take my medication only when I am sick	48.94±13.27	48.95±13.15	0.995
It is unnatural for my mind and body to be controlled by medication	47.92±14.48	49.33±12.63	0.495
My thoughts are clearer on medication	48.42±12.95	52.51±14.08	0.131
By staying on medication, I can prevent getting sick	47.67±12.87	50.42±13.34	0.131
I feel weird on medication	49.20±13.74	48.87±12.98	0.881
Medication makes me feel tired	50.19±13.31	47.99±12.97	0.231

SD=Standard deviation

medications. Other studies support this statement by reporting that side effect of medications leads to decreased adherence.^[19,20]

In this study, 181 patients (87%) stated their clear thoughts about medications and their effects. Other studies showed low medication adherence due to inadequate knowledge of treatment.^[21,22] A study done in chronic disease showed that only 44% of the patients were aware of expected length of treatment, adverse effects, and things to do for adverse effects.^[23]

Our results did not show any statistical differences between male and female patients toward their medication commitment status ($P > 0.05$). It was consistent with another study's results.^[24] Similar to observations reported in studies among patients in the Middle East, adherence was not associated with gender in the present study.^[25]

Generally, chronic disease patients take medications daily and that becomes a habit for them. This is shown in their high adherence rate. However, the medication adherence rate is lesser due to the consequences of side effects and forgetfulness in some patients. Patient adherence may be improved by sending reminders (example: telephone calls) and including family members by the health-care provider for best results.

Finding the medication adherence rate and the barriers, especially in chronic disease patients would help in improving the health care of patients. Patient's dishonesty while answering the survey questions would have resulted in a nonsignificant research study results. Moreover, duration that each patient affected by the diseases, patient's adherence behavior alteration during the time (since it is a cross-sectional study) and lack of follow-up may affect study results. This study should be conducted in large scale to generalize the results.

Nearly one-quarter of patients were nonadherent to their medications. There are so many medication and side effects. Patients especially with chronic diseases should be counseled properly about the importance of medication adherence. Moreover, reminders through telephone calls can be made to improve the adherence. Tailoring the therapy according to the individual need of the patients will maximize the patient's adherence toward medications.

Acknowledgment

We thank all the subjects and medical staff of King Fahad hospital, who were cooperative in conducting this study.

AUTHORS' CONTRIBUTION

Kousalya Prabahaar: Concept and design of study, final approval of the version to be published. Maymonah Abdullah Albalawi: Analysis and interpretation of data, drafting the article. Lama Almani and Sarah Alenizy: Acquisition of data.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Alqurashi KA, Aljabri KS, Bokhari SA. Prevalence of diabetes mellitus in a Saudi community. *Ann Saudi Med* 2011;31:19-23.
2. Ward BW, Schiller JS, Goodman RA. Multiple chronic conditions among US adults: A 2012 update. *Prev Chronic Dis* 2014;11:E62.
3. Al Dawish MA, Robert AA, Braham R, Al Hayek AA, Al Saeed A, Ahmed RA, *et al.* Diabetes mellitus in Saudi Arabia: A Review of the recent literature. *Curr Diabetes Rev* 2016;12:359-68.
4. Alqarni AM, Alrahbeni T, Al Qarni A, Al Qarni HM. Adherence to diabetes medication among diabetic patients in the Bisha governorate of Saudi Arabia – A cross-sectional survey. *Patient Prefer Adherence* 2019;13:63-71.

5. Waheedi M, Awad A, Hatoum HT, Enlund H. The relationship between patients' knowledge of diabetes therapeutic goals and self-management behaviour, including adherence. *Int J Clin Pharm* 2017;39:45-51.
6. Osterberg L, Blaschke T. Adherence to medication. *N Engl J Med* 2005;353:487-97.
7. Horne R, Weinman J, Barber N, Elliott RA, Morgan M. Concordance, adherence and compliance in medicine taking: A conceptual map and research priorities. London: National Institute for Health Research; 2006.
8. WHO. Adherence to Long-Term Therapies: Evidence for Action. Geneva: World Health Organization; 2003.
9. Khan MU, Shah S, Hameed T. Barriers to and determinants of medication adherence among hypertensive patients attended National Health Service Hospital, Sunderland. *J Pharm Bioallied Sci* 2014;6:104-8.
10. Mohamed NA. Prevalence of risk factors for diabetes mellitus and hypertension among adult in Tabuk-Kingdom Of Saudi Arabia. *Open Access Maced J Med Sci* 2019;7:831-7.
11. Thompson K, Kulkarni J, Sergejew AA. Reliability and validity of a new medication adherence rating scale (MARS) for the psychoses. *Schizophr Res* 2000;42:241-7.
12. Owie GO, Olotu SO, James BO. Reliability and validity of the medication adherence rating scale in a cohort of patients with schizophrenia from Nigeria. *Trends Psychiatry Psychother* 2018;40:85-92.
13. Kousalya K, Vasantha J, Ponnudurai R, Sumitkumar G, Ramalakshmi S, Saranya P, *et al.* Study on non-adherence and the effect of counseling in the pharmacological management of psychiatric patients. *Int J Pharm Biosci* 2012;3:102-9.
14. Lemay J, Waheedi M, Al-Sharqawi S, Bayoud T. Medication adherence in chronic illness: Do beliefs about medications play a role? *Patient Prefer Adherence* 2018;12:1687-98.
15. Al-Foraih M, Somerset S. Factors affecting adherence to statins in hypercholesterolemic Kuwaiti patients: A Cross-sectional study. *Med Princ Pract* 2017;26:35-40.
16. Krueger K, Botermann L, Schorr SG, Griese-Mammen N, Laufs U, Schulz M, *et al.* Age-related medication adherence in patients with chronic heart failure: A systematic literature review. *Int J Cardiol* 2015;184:728-35.
17. Davies MJ, Gagliardino JJ, Gray LJ, Khunti K, Mohan V, Hughes R. Real-world factors affecting adherence to insulin therapy in patients with Type 1 or Type 2 diabetes mellitus: A systematic review. *Diabet Med* 2013;30:512-24.
18. Latry P, Molimard M, Dedieu B, Couffinal T, Bégaud B, Martin-Latry K, *et al.* Adherence with statins in a real-life setting is better when associated cardiovascular risk factors increase: A cohort study. *BMC Cardiovasc Disord* 2011;11:46.
19. Tedla YG, Bautista LE. Drug side effect symptoms and adherence to antihypertensive medication. *Am J Hypertens* 2016;29:772-9.
20. Arifulla M, John LJ, Sreedharan J, Muttappallymyalil J, Basha SA. Patients' adherence to anti-diabetic medications in a hospital at Ajman, UAE. *Malays J Med Sci* 2014;21:44-9.
21. Dehdari L, Dehdari T. The determinants of anti-diabetic medication adherence based on the experiences of patients with type 2 diabetes. *Arch Public Health* 2019;77:21.
22. Siddiqui MH, Khan IA, Moyeen F, Chaudhary KA. Identifying barriers to therapeutic adherence in type 2-diabetes: A complex and multidimensional clinical issue. *Asp Biomed Clin Case Rep* 2019;2:22-8.
23. Sneha K, Ramalakshmi S, Kousalya K, Saranya P. An assessment of patient medication adherence to long term antidepressants in a tertiary care teaching hospital in India. *Univers J Pharm* 2013;2:97-101.
24. Crawshaw J, Auyeung V, Norton S, Weinman J. Identifying psychosocial predictors of medication non-adherence following acute coronary syndrome: A systematic review and meta-analysis. *J Psychosom Res* 2016;90:10-32.
25. Awwad O, Akour A, Al-Muhaissen S, Morisky D. The influence of patients' knowledge on adherence to their chronic medications: A cross-sectional study in Jordan. *Int J Clin Pharm* 2015;37:504-10.