Original Article

Assessment of Medication Adherence Using Malaysia Medication Adherence Assessment Tool in a Tertiary Care Hospital in Peshawar, Pakistan

Muhammad Tariq Mehr,[1] Hafsa Parveen,[1] Qamar Un Nisa,[2] Ali Qaisar Jadoon[3]

[1]Hayatabad Medical Complex, Peshawar-Pakistan, [2]Rehman Medical Institute, Peshawar-Pakistan, [3]United Medical & Dental College, Karachi-Pakistan

Abstract

Objective: To assess the adherence to medications using Malaysian Medication Adherence Assessment tool in patients suffering from chronic health conditions admitted in a tertiary care hospital.

Methods: This cross-sectional study was carried out at in the Department of Internal Medicine, Hayatabad Medical Complex, Peshawar, from 1st January to 31st March, 2023. All the patients admitted having chronic medical conditions were included, using convenient non-probability sampling technique. Medication adherence was assessed by adopting Malaysia Medication Adherence Assessment Tool using five-point Likert scale. The higher the score, the better the adherence with the medications with a mean cut-off of 54 for the poor and good adherence. All the variables were analysed and respective frequency and percentages were calculated. Non-compliance with the medications was compared and correlated with rest of the variables by using chi-square test and p-value ≤ 0.05 was considered as significant.

Results: A total of 201 patients were included having mean age of 56.27 ± 16.48 years, with 108 (54.2%) females and 92(45.8%) males. The general frequency of non-adherence was observed in 59%. The mean MyMAAT Score cut-off of ≤ 53 (poor adherence) for the non-compliance was reported in all the included individuals. Further stratification of the non-compliance was analysed for age, acquired education, monthly income, profession and gender and we observed no statistically significant difference.

Conclusion: We observed a high prevalence of medications non-adherence in our limited pilot study and requires large multi-centre studies with good representation from all segments to know the factors causing non-adherence, guiding the further strategies for improvement.

Keywords: Medications Adherence, Non-compliance, Medications

Introduction

The father of medicine, Hippocrates, first became aware of medication non-adherence during ancient times (circa 400 BC). He observed that patients who disregarded their medication prescriptions later complained of unsuccessful treatment. According to Robert Koch, noncompliant tuberculosis patients are "vicious consumptives".[1] Medication adherence refers to the extent with which an individual continues to adhere to the prescribed treatment regimen by the consulting health care professional.[2] The adherence is influenced by a variety of social, economic, cultural and personal factors which continue to cast a variable but significant influence on the compliance with the medications.[3]

The available data across the world has reported a varied drug compliance figures between 20 to 80% in various chronic medical conditions.[4] The review of literature reports that that diverse factors in the form of poor disease knowledge, meagre heath literacy, cognitive decline in the elderly population, poly-pharmacy, cost and complexity of the treatment and side effects of the prescribed medicines have a variable contribution to the poor adhe-

rence with the prescribed medications.[5] Ford et al structured a systemic review and a meta-analysis and recounted that the three pivotal barriers to treatment compliance were forgetfulness (three studies, 81.1%; 95% CI, 68.7-93.5%), meager understanding of the need for compliance (two studies, 32.3%; 95% CI, 17.2-47.4%), and recurrent changes in the daily activities (two studies, 27.4%; 95% CI, 4.7-50.1%).6

Most of the previous studies done across Pakistan have evaluated the drug compliance against either a single disease or a few diseases. The patients who visit tertiary care hospitals are typically suffering from chronic medical conditions and are prescribed life-long medicines for their health. They have to adhere to the poly-pharmacy with expected drug-drug interactions and possible side effects, pay for the medication and keep a close follow-up with the treating doctors for improved health outcomes. Knowing the poor socioeconomic conditions and lesser understandings, we felt there is a gap in the available literature to correctly evaluate the drug compliance in this population, and hence devised this study project.

Methods

This cross-sectional study was carried out at in the Department of Internal Medicine, Hayatabad Medical Complex, Peshawar, from 1st January to 31st March, 2023. Formal approval of ethics review committee of the institute was obtained. All the patients admitted in the internal medicine department of the hospital, whether through emergency or the routine outpatients department were included in the study using convenient non-probability sampling technique. A fully informed consent was obtained from all the participating individuals. All the enrolled patients were having one or more chronic medical conditions requiring life-long medications. Patients who had a language barrier, were struggling to understand the questionnaire, or had incompletely or wrongly filled the questionnaire were excluded from the study. The literate patients were explained about the contents of the questionnaire and asked to fill the questionnaire on their own whereas the illiterate were helped by three of the dedicated doctors who were recording the responses.

Medication adherence was assessed by adopting the already used and validated Malaysia Medication Adherence Assessment Tool (MyMAAT-12), which was translated in Urdu and Pushto languages. A five-point Likert scale with strongly disagree, disagree, neutral, agree, and strongly agree was used. On a 21 item scale, the scores for all the items ranged from minimum of 21 to maximum of 105 by assigning 5 marks to the strongly disagree and 1 mark to the strongly agree response. The higher the score, the better the adherence with the medications with a mean cut-off of 54 for the poor and good adherence.[7]

Data was also collected about different socio-demographic and treatment-related variables that could potentially affect compliance, such as age, gender, education, monthly income, employment status and profession. Data were analysed using SPSS version 23. All the variables analysed and respective frequency and percentages were calculated. Non-compliance with the medications was compared and correlated with rest of the variables by using chi-square test and p-value ≤0.05 was considered as significant.

Results

We enrolled a total of 229 patients after their consent, with a 100% response rate for the inclusion. However, a total of 28 patients failed to meet the inclusion criteria and were hence excluded from the study. The mean age of included patients was 56.27 ± 16.48 years, with 108 (54.2%) females and 92(45.8%) males. The general frequency of non-adherance was observed in 59% (118). The mean MyMAAT Score cut-off of ≤53 (poor adherence) for the non-compliance was reported in all the included individuals. Further analysis of the data was done to know the non-compliance with respect to the various variables like age, acquired education, monthly income, profession and gender as displayed in table 1.

Discussion

Poor adherence with the prescribed treatment plan remains universal across the globe. The reported data about the drug adherence from the western part of the world, with improved health facilities, higher GDP, and enhanced understanding of the illnesses varies around 83.8% in Europe and parts of US.8 The results are not uniform across Europe with a study in Italy reporting an adherence of only 19.3%.[9] The data from Pakistan varies from 50% reported by Ali et al to 38.3% adherence by Mahmood et al.[10,11]

The results of our study are showing very dismal state of affairs with 100% non-compliance with the prescribed medications over the long term for chronically ill patients who were reviewed while admitted in a tertiary care hospital. We remain mindful of the fact that the adherence was assessed for all the current and ongoing multiple illness which remain the core cause of the reported poor compliance with the prescribed treatment regimen. These poor adherence is supported by reviewing the results of a study done on patients' prescribed antiviral treatment for chronic infection with hepatitis B which reported non-compliance in 15.7%.[12] These results display a better outlook than our results primarily because of free dispensing and the compliance was assessed against a single drug, for limited time. Moreover, the

Table 1: *Characteristics factors for non-compliance (No mean values are presented by % sign. Kindly confirm these values)*

	Characteristics	Mean (n)	Mean MyMAAT-21 Score (Std Dev)	P-value.
Gender	Male	45.8%(92)	33.22(6.748)	0.127
	Female	54.2%(108)	34.81 (7.825)	
Age	18-40	13.4%(27)	35.85 (5.836)	0.10
	41-60	49.3%(99)	33.25 (7.217)	
	61-80	32.3%(64)	33.58 (7.715)	
	81-100	5.0%(10)	**40.70(7.273)**	
Education	Illiterate	47.3%(95)	32.62 (7.270)	**0.033**
	Primary	13.9%(28)	36.00 (10.114)	
	Secondary	19.4%(39)	**36.13 (6.044)**	
	Bachelor's & above	19.4%(38)	34.21(5.776)	
Monthly Income	Below 100,000 PKR	25.9%(52)	33.75 (7.718)	**0.027**
	100,000-200,000 PKR	35.3%(71)	32.52 (7.939)	
	Above 20000 PKR	38.8%(77)	**35.74 (6.265)**	
Employment	Unemployed	32.8%(66)	**35.08 (9.373)**	0.084
	Self employed	33.8%(67)	34.90 (5.990)	
	Government Employee	15.9%(32)	33.03 (6.655)	
	Private Employee	17.4%(35)	31.60 (5.451)	
Profession	Housewife	29.9%(60)	34.82 (8.131)	0.084
	Doctor	6.5%(13)	31.31 (5.073)	
	Teacher	6.5%(13)	**37.62 (8.732)**	
	Engineer	9.0%(18)	36.22 (6.160)	
	Business	13.4%(26)	34.38 (5.636)	
	Others	34.8%(70)	32.64 (7.356)	

medication adherence dropped further in a similar limited study in the same military hospital setting to 60%, when it was evaluated for four chronic medical conditions.[13] These results again have to be seen in context that the included patients had access to free medications and healthcare facilities unlike our study population who had to pay for all the treatment cost.

A single center study, done in a tertiary care hospital of Peshawar, visiting the outpatient department, on hypertensive population reported a poor adherence in 56.8% of the participating individuals.[14] On further stratification of our data results, we observed that age and gender of the patients had no significant difference with regard to the compliance, with MyMAAT score of 32.2 in males and 34.81 in females. Even though statistically not significant but the score in the elderly population of more than 81 years (40.70) was far better that than the middle age (33.25) between 41 to 60 years. Khan A et al. are observed the same pattern and reported that age was not statistically significantly associated with non-adherence to the medications.[12] With regard to other variables, the impact of education with regard to adherence and expected better compliance in the more educated population was not observed. A systemic review done on 243 studies using a mixed methods approach reported that the most common causes of non-adherence were young age with low income and education, more side effects, varied cultural and religious beliefs and higher cost of the medicines.[15]

The influence of the monthly income had a statistically non-significant impact while observing that the higher income strata had a mean MyMAAT score of 35.74 as compared to those earning less (33.75). Similarly, the employment had no significant impact on the medication compliance. The results of the different professions of the participating individuals are very interesting with the better compliance score of 37.62 amongst the group being observed in the teachers. The dismal poor performance amongst the doctors with a mean score of 31.31, making 6.5% of the study population is very worrying, because they are usually expected to have a better understanding of the need for using the prescribed medications in time. The perceived association of better compliance in more educated individuals is not universal seeing the results of a recently published systemic review of 27 studies done by Hyvert S et al with reported no relationship in 9, mixed relationship in 3 and even negative relationship in one of the studies.[16]

Limitations of the Study: The major limitations of the study is the sample inclusion from a tertiary care hospital where the usual patients are expected to have multiple problems and many medications, hence the results cannot be extrapolated in the primary care where usually the patients have a single or few diseases. The sample size was small and self-reporting technique was used to fill in the structured questionnaire.

Conclusion

The results of this pilot project conducted in a tertiary care hospital look dismal and display a very sad state of affairs with regard to the adherence with the prescribed medications in patients who are admitted in tertiary care hospitals with varied health related conditions. However, they highlight a very important yet neglected aspect of patient care and calls for a large multicenter trial with sizable sample to know the diverse socioeconomic and cultural factors and then devise targeted strategies to improve them with an expected better treatment compliance.

Conflict of Interest: *None*
Funding Source: *None*

References

1. Smith SC Jr, Benjamin EJ, Bonow RO, Braun LT, Creager MA, Franklin BA, Gibbons RJ, Grundy SM, Hiratzka LF, Jones DW, et al. AHA/ACCF Secondary Prevention and Risk Reduction Therapy for Patients with Coronary and other Atherosclerotic Vascular Disease: 2011 update: a guideline from the American Heart Association and American College of Cardiology Foundation. Circulation. 2011;124(22):2458–73.

2. Muellers KA, Chen L, O'Conor R, Wolf MS, Federman AD, Wisnivesky JP. Health literacy and medication adherence in COPD patients: when caregiver presence is not sufficient. J Chron Obstruct Pulmo Dis. 2019; 16 (5-6):362-7.

3. Huang YM, Shiyanbola OO. Investigation of barriers and facilitators to medication adherence in patients with type 2 diabetes across different health literacy levels: an explanatory sequential mixed methods study. Front Pharmacol. 2021;12(1):745749.

4. Simoni JM, Frick PA, Pantalone DW, Turner BJ. Anti-retroviral adherence interventions: a review of current literature and ongoing studies. Top HIV Med. 2003; 11(6): 185-98.

5. Ibrahim Aliafsari Mamaghani, Edris Hasanpoor, Esmaiel Maghsoodi, Farzaneh Soleimani. Barriers to Medication Adherence among Hypertensive Patients in Deprived Rural Areas. Ethiop J Health Sci.2020; 30(1): 85.

6. Ford N, Scourse R, Lemoine M, Hutin Y, Bulterys M, Shubber Z, et al. Adherence to nucleos(t)ide analogue therapies for chronic hepatitis B infection: a systematic review and meta-analysis. Hepatol Commun 2018; 2(10): 1160-7.

7. Hatah E, Rahim N, Makmor-Bakry M, Mohamed Shah N, Mohamad N, Ahmad M, Haron NH, Sze Hwe C, Tan Meng Wah A, Hassan F, Shaik Rahmat S. Development and validation of Malaysia medication adherence assessment tool (MyMAAT) for diabetic patients. PloS One. 2020;15(11):e0241909.

8. Uchmanowicz B, Jankowska EA, Uchmanowicz I and Morisky DE. Self-Reported Medication Adherence Measured with Morisky Medication Adherence Scales and Its Determinants in Hypertensive Patients Aged ≥ 60 Years: A Systematic Review and Meta-Analysis. Front Pharmacol. 2019;10(3):423226.

9. Franchi C, Ardoino I, Ludergnani M, Cukay G, Merlino L, Nobili A. Medication adherence in community-dwelling older people exposed to chronic polypharmacy. J Epidemiol Community Health. 2021;75(9):854-9.

10. Ali K, Adil S O, Soomro N, Bibi A, Kalam S. Drug compliance and its associated factors among hypertensive patients in Pakistan: A cross-sectional study. Hosp Pharm. 2018;53(6):389-92.

11. Mahmood S, Jalal Z, Hadi MA, Orooj H, Shah KU. Non-Adherence to Prescribed Antihypertensives in Primary, Secondary and Tertiary Healthcare Settings in Islamabad, Pakistan: A Cross-Sectional Study. Patient Prefer Adherence. 2020;14(1):73-85.

12. Khan A, Farooq A, Arshad AR, Saeed F. Factors Associated with Non-Adherence to Hepatitis B Virus Antiviral Therapy. Pak Armed Forces Med J. 2021; 71(6): 2065-2069.

13. Shakeel M, Shakeel R, Fatima A, Tasawar A, Qamar K. A comparative study of adherence and non-adherence to medication amongst patients of different system specific diseases. Pak Armed Forc Med J. 2020; 70(2): 590-93.

14. Akhtar Y, Afridi MAR, Ali Z, Khan MA. Factors affecting adherence to medications in hypertensive patients visiting a teaching hospital in Khyber Pakhtunkhwa. J Postgrad Med Inst. 2022;36(2):85-90.

15. Konstantinou P, Kassianos AP, Georgiou G, Panayides A, Papageorgiou A, Almas I, Wozniak G, Karekla M. Barriers, facilitators, and interventions for medication adherence across chronic conditions with the highest non-adherence rates: a scoping review with recommendations for intervention development. Transl Behav Med. 2020;10(6):1390-8.

16. Hyvert S, Yailian AL, Haesebaert J, Vignot E, Chapurlat R, Dussart C, De Freminville H, Janoly-Dumenil A. Association between health literacy and medication adherence in chronic diseases: a recent systematic review. Int J Clin Phar. 2023;45(1):38-51.