

Adherence and Medication Adherence Rating Scale (MARS)

Autori: Lana Lekic, mr.ph. spec, PhD, Faculty of Health Studies, University of Sarajevo, Bosnia and Herzegovina,
Azra Osmanović, mr.ph, Faculty of Pharmacy, Pharmacognosy, University of Tuzla,

Bojan Pavlović, dr.med, Faculty of Sports and Physical Education Sarajevo, University of Sarajevo,
Karahmet Emina PhD, Faculty of Pharmacy, University of Modern Science, 88000 Mostar

Farooq Sher, PhD, Department of Engineering, School of Science and Technology, Nottingham Trent University, Nottingham,
NG11 8NS, UK

Abstract:

Objectives: The aim of the paper is to analyze the influence of factors on the adherence level, primarily analyzing the factors influenced by the patients. In addition, the paper contains an analysis of the impact of drugs on the mental and physical condition of patients, as well as an analysis of patients' perception of treatment process.

Methods: Medication Adherence Rating Scale (MARS) questionnaire was used as a tool in the research. It was distributed online and included 194 respondents. The questionnaire consisted of two sections: general data on respondents and questions related to medication adherence rating scale.

Results: The research results suggest there is a significant percentage of non-adherent patients, where a considerable number of them stops consuming drugs on their own initiative. There is equally a great number of respondents who forget to consume their medication. The research results imply the drugs do not produce major impact on the mental, psychological and physical condition of the patient. A considerable number of the respondents encounter prejudices about the drug consumption and use.

Conclusion: More active involvement of healthcare professionals in the process of providing health care is necessary to improve the adherence level. By increasing the education level of doctors and patients, it is possible to increase the level of patient's adherence.

Keywords:- Adherence, MARS, Dimensions of Adherence, Non-Adherence

I. INTRODUCTION

The development of the health system is an extremely important aspect for all countries, especially developed ones. One of the indicators of the country's development is the development of the healthcare system. However, the question may be how to improve the health system? Certainly, increasing the level of patient's adherence leads to increased treatment efficiency and creates multiple positive effects for all participants in the healthcare delivery process.

Unfortunately, even the most developed countries experience a significant problem in the segment of the patient's adherence level. Analyzing future trends, it is possible to expect a further increase in the percentage of non-adherent patients, primarily due to the increasing practice of purchasing and consuming drugs at their own choice, without visiting or consulting the doctors¹.

It is possible to find many definitions of adherence in the literature. In short, it represents the level to which the patient follows the doctor's recommendations and the prescribed treatment, which does not involve only the consumption of prescribed drugs, according to the dynamics, quantity and time intervals. Adherence is much more than consuming medication, it represents the adjustment of lifestyle, diet, physical activity, etc. together with physician prescriptions.

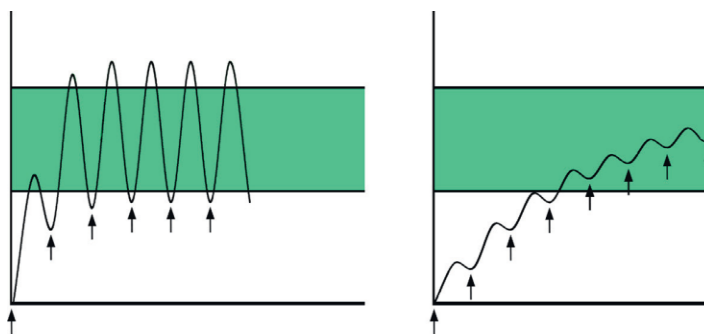
A high adherence level is necessary for a positive and effective treatment. However, there are a number of aspects that affect the adherence level, which are grouped according to the five dimensions of adherence²: social and economic factors, health care and factors related to the health system, factors related to the condition, factors related to therapy, factors related to the patient. Each of the dimension has a number of elements that have a different impact on each individual level of the patient's adherence. An additional problem represent inadequate methods for measuring the adherence level. They are grouped as direct and indirect, but each of the methods has its advantages and disadvantages. Methods that are easy to apply in most cases do not have

¹ Mir S.A., Muzamil F., Din Bhat M., Amin A., Shakeel D. (2019). Assessment of medication adherence among patients with chronic diseases: a descriptive cross-sectional study. IJBCP, Vol8, No 1. (Pristupni link:<https://www.ijbcp.com/index.php/ijbcp/article/>

² Sircar A. (2019). Medication adherence for elderly patients with chronic conditions (Thesis). (Pristupni link: <https://medium.com/the-new-healing-touch/problem-space-f970a66c9255>)

accurate and reliable information, and mostly are not objective³. In addition, there is no historical data on the adherence level, due to the lack of a system of records and data storage, regardless of which method is used.

For a high treatment efficiency, it is necessary to have an adequate concentration of the drug in the patient's body, which should be constant during the treatment, i.e. if it is a chronic patient, then it should be constant over a longer period of treatment, which is presented in the figure below.



Graph 1: Pharmacokinetic schedule of multiple dose concentrations of drug over time for short half-life drug (a) and long half-life drug (b)

Source: Tanna S., Lawson G., 2016.

Some of the most common reasons of patients' non-adherence include the following aspects groups: demographic, sociocultural, behavioral, etc. which relate to^{4, 5, 6}: forgetfulness, cultural, religious beliefs, lack of understanding of the disease, physical, mental, emotional state, physical difficulties in the context of limited abilities, lack of involvement in the treatment and decision-making process, side effects, various demographic factors such as gender, education, marital status, etc. ., high costs, complexity of treatment, limited access to medical institutions, high expectations, etc.

Many diseases affect the patient's lifestyle, i.e. treatment requires changes in lifestyle and changes in daily activities and routines⁷, which is a problem for many

patients, especially if there is a lack of support from family and friends.

The improvement of adherence level can be made with the help of various models and strategies. One of them is the improvement of cooperation between patients and health care providers, primarily thinking of⁸: analysis of the time necessary for the doctor to spend with the patient, improving the relationship between patients and doctors, improving communication skills of health care providers, educating patients, talking about patients' beliefs, their expectations, providing support and motivation, analysis of patient's status (economic, physical, mental, etc.), discussion and finding adequate solutions to side effects, discussion on the necessity of lifestyle change, etc.

During conversations with patients, physicians should ask questions based on which they can identify potential difficulties and problems in the treatment process⁹: how will the medication schedule "fit" into the patient's daily schedule, how will the patient store the medication, how the patient plans to consume it, how will he monitor compliance with therapy regulations, etc.?

Based on the presented theoretical aspects, it is possible to get an insight into the issue of patient's adherence. For a detailed analysis, it is necessary to look at additional sources and literature related to the subject. The previous theoretical aspects represent an introduction that is sufficient to understand the research results presented below.

II. RESULTS

The Medication Adherence Rating Scale (MARS) is an improved version of the DAI study by a group of authors^{10, 11}. MARS is considered to have greater validity and clinical utility. The conducted research includes an online questionnaire that contains 10 research questions along with specific questions added by the authors, which relate to the general data of the respondents. The survey was conducted in March, 2021 and distributed through alternative communication channels. The total number of completed questionnaires was 194.

study. IJBCP, Vol8, No 1. (Pristupni link:<https://www.ijbcp.com/index.php/ijbcp/article/>)

³ Tanna S., Lawson G. (2016). Analytical Chemistry for Assessing Medication Adherence. Elsevier Inc.

⁴ Kaplan A., Price D. (2020). Treatment Adherence in Adolescents with Asthma. Journal of Asthma and Allergy » Volume 13, str. 42

⁵ Shah K.N., Cortina S., Ernst M.M., Kichler J.C. (2015). Psoriasis in childhood: effective strategies to improve treatment adherence. Psoriasis (Auckl), 5: 43–54. (Pristupni link:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5683111/>)

⁶ Ferdinand C.K., Senatore F.F. i ostali (2017). Improving Medication Adherence in Cardiometabolic Disease: Practical and Regulatory Implications. JACC VOL. 69, NO. 4.

⁷ Mir S.A., Muzamil F., Din Bhat M., Amin A., Shakeel D. (2019). Assessment of medication adherence among patients with chronic diseases: a descriptive cross-sectional

⁸ Ferdinand C.K., Senatore F.F. i ostali (2017). Improving Medication Adherence in Cardiometabolic Disease: Practical and Regulatory Implications. JACC VOL. 69, NO. 4.

⁹ Barnett N.L. (2016). Medicines adherence and coaching in cardiology. British Journal of Cardiac Nursing, Vol 10 No 8.

¹⁰ Thompson K., Kulkarni J., Sergejew A.A. (2000). Reliability and validity of a new Medication Adherence Rating Scale (MARS) for the psychoses. Schizophr Res;42:241–7.

¹¹ Morisky D.E., Green L.W., Levine D.M. (1986). Concurrent and predictive validity of a self-reported measure of medication adherence. Med. Care;24:67–74.

Analyzing the general data, it is possible to conclude the majority of respondents belong to the female (95.4%) and are middle-aged (less than 30 years - 29.4%; from 31 to 40 years 47.9%; from 41 to 50 years - 17 from 51 to 60 years - 5.2%; over 61 years - 0.5%). Most of the respondents are highly educated with academic titles (Basic - 0.5%; medium education - 23.7%; Bachelor / Bachelor - 36.6%; Master / Doctorate - 39.2%), and most of the respondents are

employed (Employed- 67%; Retired - at 1%; Student - 11.3%; Unemployed - 20.6%).

MARS table with the research results is presented below, in which the questions are presented together with the number of respondents who answered in the affirmative or negative. The table also contains a percentage share in the answers to the questions asked.

	Question	Yes		No	
		n	%	n	%
1	Do you ever forget to take your medication?	138	71,10%	56	28,90%
2	Are you careless at times about taking your medication?	107	55,20%	87	44,80%
3	When you feel better, do you sometimes stop taking your medication?	112	57,70%	82	42,30%
4	Sometimes if you feel worse when you take the medication, do you stop taking it?	140	72,20%	54	27,80%
5	I take my medication only when I am sick	146	75,30%	48	24,70%
6	It is unnatural for my mind and body to be controlled by medication	132	68,00%	62	32,00%
7	My thoughts are clearer on medication	21	10,80%	173	89,20%
8	By staying on medication, I can prevent getting sick.	81	41,80%	113	58,20%
9	I feel weird, like a 'zombie' on medication	17	8,80%	177	91,20%
10	Medication makes me feel tired and sluggish	21	10,80%	173	89,20%

Table 1: MARS (Medication Adherence Rating Scale)

Source: CERP. Adherence rating scales, access link: <https://easacommunity.org/files/Medication%20Adherence%20Scale.pdf>, Last Accessed: 10.11.2020.

In a large number of studies in the world, some of which are listed in the introductory part of the paper, the problem of a low adherence level is clearly presented. The causes of non-adherence can be numerous, where forgetfulness is one of the most common, as the dimension of adherence influenced by the patients. Based on the results of the research, it is possible to conclude that over 70% of the respondents expressed the opinion they forgot to consume medication, which directly affects the adherence level.

Additional causes of non-adherence are negligence of proper follow-up of treatment therapy, according to the instructions and recommendations of physicians that do not relate exclusively to the segment of drug consumption. Thus, for example, in the second research question, more than half of the respondents stated they are sometimes negligent when consuming drugs. The research did not analyze in detail the root cause of negligence, but one of them is presented in the research results, which will be explained below.

One of the significant problems that cause non-adherence is the fact that certain patients voluntarily stop consuming drugs and thus take a "break from consuming drugs". According to the results of the research, it is possible to conclude that almost 60% of the respondents stop being adherent in the case the drugs have an effect, i.e. that they feel better. For the success of therapy, in the context of drugs, it is very important there is a continuous dose of the drug in the body that is achieved by continuous, proper consumption of the drugs (in quantity and predicted dynamics).

Patients stop consuming drugs not only when the drugs are effective, but also when the drug causes a certain side effect, especially if it affects their ability and lifestyle. Thus, for example, over 70% of respondents expressed they stop consuming medication when they feel worse.

Inadequate continuity in drug consumption and low adherence level can cause significant oscillations, which can ultimately cause changes in the dynamics of therapy according to patients' feelings. According to the research results, over 70% of respondents take the medicine only when they are sick, which, can significantly worsen the patient's condition, lead to complications or lead the doctor to conclude the prescribed treatment is not adequate.

Almost 70% of the respondents believe it is unnatural for their body to be controlled by drugs. The results of this research may indicate the fact that respondents have certain beliefs or attitudes that are formed contrary to the views of the medical profession and relevant research. These attitudes and beliefs of the respondents can significantly affect the adherence level. It is also necessary to analyze the attitudes of the respondents and the reasons stated in the research results.

According to the research results related to the effect of the drugs on thoughts, most of the respondents (almost 90%) believe the drugs do not affect their thoughts, i.e. their mental and psychological abilities are not affected by drug consumption. This aspect is extremely important because the influence of the drugs on the patient's abilities greatly affects the adherence level.

The research results show the respondents have divided opinions related to the relationship between drug consumption and its impact on the medical condition. The respondents' beliefs on this research question can be formed by their own attitudes and beliefs (traditional, religious, etc.) and which are contrary to the medical side and science.

According to the research, over 90% of the respondents do not have side effects that create negative feelings when consuming drugs. This segment is crucial, since the negative effects greatly influence the decision to continue using the prescribed treatment. Additionally, according to the answers on the last question, the respondents do not have the negative effects related to the creation of fatigue and impaired ability of the respondents.

III. CONCLUSION

The results of the research suggest the respondents do not have significant negative effects in the process of consuming drugs, which reduce their mental and physical abilities. At the same moment, the results point to the conclusion there is a high percentage of the respondents who forget to take medication, they are sometimes careless, and they stop consuming medication in case they feel better/worse. On the basis of the respondents' answers it can be concluded that certain beliefs are created as prejudices, whether drug consumption is natural or not. Also, the respondents expressed certain views that indicate consuming medications may be the result of their own beliefs and opinions, based on feelings rather than clear instructions from the doctor. The research results are correlated with other research results conducted by the authors. The key recommendations by the authors, based on the conducted research and many others publicly available, relate to the need of increasing the level of education, but also increasing the quality of relationship between the patient and physician and time spent. The presented research results can be used in the development of activities to increase the adherence level, indicating that certain segments require more detailed analysis and additional research.

DECLARATION OF INTEREST

The authors declare that there are no conflicts of interest.

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