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Research Article

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Adherence to Medications among Outpatient Adults with Multiple Sclerosis in Medina Province in Ksa (Cross-Sectional Study)

Salma Moteb T Al-Mutairi[1], Hatim Muhammad H Alshalahi[2], Sara Moteb T Al-Mutairi[3] and Abid M Kareem[4]

[1]*Currently medical intern, was At Ibn Sina National Collage, Bachelor of Medicine, Bachelor of Surgery.*

[2]*Currently medical intern, was At Taibah University, Bachelor of Medicine, Bachelor of Surgery.*

[3]*Third pharmacy At Ibn Sina National Collage, Bachelor of pharm D.*

[4]*Consultant Neurologist, , at king fahad hospital, Medina ALmonawarah, Saudi Arabia.*

Abstract: Multiple sclerosis (MS) is a chronic, inflammatory, progressive, demyelinating disease of the central nervous system. Treatment for MS involves long-term disease-modifying therapies (DMTs). Medication adherence in chronic diseases like MS plays an important role in predicting long-term outcomes. This is a cross-sectional, survey-based study was done to assess adherence to medications among adults suffering from MS in Medina Province, Saudi Arabia. The study sample included 90patients diagnosed with multiple sclerosis. These databases contain information about disease presentation, drug prescription, vital status, residency, and role of contact to patient. All the collected data were analyzed by an SPSS program, version 20, and p value < 0.05 was considered significant. A response rate among the MS patients was 97.78%, and their mean age was 36.13±9.58. Most of the participants were above 35 years (55%) and were females. About 37.8% of patients was considered to be adherent to the drugs. The mean total score of BMQ Specific-Necessity was 3.25±0.70 and about 63.4% total score=3 and the mean total score of BMQ Specific-Concerns was (3.34±0.703). About 84.4% total score=3. The mean total score of BMQ General was 3.2727±0.31, and about 81.1% had a total score=3. The mean total score of compliance was 3.2023±0.393.We concluded that many factors affected the patient's adherence to the drug rather than of being dependence to the drugs as worrying about side effects and the cost of the drug.

Keywords: Adherence, Medications, Multiple sclerosis, adult, prescription

***Corresponding Author**

Hatim Muhammad H Alshalahi , currently medical intern, was At Ibn Sina National Collage, Bachelor of Medicine, Bachelor of Surgery

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1. INTRODUCTION

Multiple sclerosis (MS) is one of the chronic demyelinating diseases of the central nervous system which is inflammatory and progressive. It affects mostly young adults and had higher incidence rates in females and Caucasians [1]. The first symptoms of the disease typically appear in young adults between 20 and 40 years of age which was presented mainly with visual disturbances and difficulties in movement. Due to the physical consequences of the disease, it is one of the main causes of disability among young adults and its management is a serious challenge for healthcare systems [2]. MS has been widely documented in Canada and the United Status [3]. Howeverdata about MS in the Arab world is still not clear and insufficient. In the Arabian Gulf countries, variation in MS prevalence rates have been reported with the highest prevalence rates in Kuwait (85.0/100,000), intermediate rates in the Qatari population (64.6/100,000), and low prevalence rate in Dubai of the United Arab Emirates (54.8/100,000) [4]. Treatment for MS involves long-term disease-modifying therapies (DMTs) aimed at reducing the severity of symptoms. DMT constitute the current first-line treatment option for relapsing-remitting and secondary progressive MS because they reduce the relapse rate and slow down disability progression [5].The World Health Organization (WHO) (2003) defines adherence to treatment as the extent to which a person's behavior in taking medication, following a diet, and/or executing lifestyle changes corresponds to recommendations from a health care provider .[6]Medication adherence in chronic diseases like MS plays an important role in predicting the long-term outcomes of the patients. However, research has shown that long-term adherence to DMT represents a significant challenge for patients with MS [7]. Barriers to treatment adherence in MS patients include the chronic nature of MS, fear of injection and adverse events, perceived lack of efficacy, treatment fatigue, drug type, and health system factors [4-8]. Non-adherence behavior is not only costly in terms of time, money, and resources; it can also threaten the relation between doctor and patient. [5&9] However, in order to achieve the intended therapeutic effect, the patient must follow the treatment recommendationssuch as taking the drug according to the prescribed dosage for the duration of the treatment. WHO indicates that only half of the patients suffering from chronic diseases adhere to treatment recommendations.[10] Recent studies on MS patients have shown that the percentage of people who strictly adhere to treatment recommendations ranged from 49% to 93% [4]. However, previous studies have indicated that a level of adherence above 80% can be considered optimal as the adherence at this level has a significant effect in reducing the risk of hospitalization, acute medical visits and total expenditures for the management of MS patients [11]. In this study, we tried to assess adherence to medication among adults suffering from MS in Medina province, Saudi Arabia.

2. PATIENTS AND METHODS

2.1 Type of study

This is a cross-sectional survey-based study. Conducted over a period of two years from 2016 to 2018.

2.2 Research locale

2.2.1 Study population

The population-based health administrative data from King Fahad Hospital was used as it represents the province's health services databases and population registry that are linkable using unique identifiers. These databases contain information about disease presentation, prescription of drugs, vital status, residency and role of contact to patients. The study sample included 90 patients diagnosed with MS who fulfilled 2010 revised McDonald criteria [12]. Inclusion criteria list patients over 18 years of age, previously diagnosed with MS for at least one year and treated by taking one of MS drugs, should have a normal neurological and cognitive development, and should not have any other severe comorbidities. Patients below 18 years or above 65 years and patients visiting for follow-up without complaint were excluded from the study.

2.2.2 Data collection

Upon receiving ethical committee approval and informed consent patients previously diagnosed with MS were contacted to participate in a survey after completing the questionnaire. The questionnaire used included independent and dependent variables. Independent variables were socioeconomic characteristics (marital status, education, and employment state) and personal characteristics (gender and age). The dependent variables:

1) The first dependent variable was the adherence to treatment with drugs used to treat MS assessed by the Morisky Medication Adherence Scale (MMAS-8) (Morisky et al.) [13] Use of medication referred to forgetting to take the medication, stopping the medication on his or/her own when feeling better; stopping medication when feeling worse and problems related to the complexity of the therapy, the four questions are expected to be answered negatively. The degree of adherence to the treatment was determined by the scoring of the sum of all correct answers. Patients who scored 4 in the MMAS-8 were considered adherent.

2) The second dependent variable dealt with beliefs about medicines (BMQ) [14] for MS and comprised two sections: the BMQ-Specific, which assessed representations of medication prescribed for personal use, and BMQ-General, which assessed beliefs about medicines in general. The BMQ-Specific section comprised two 5-item factors assessing beliefs about the necessity of prescribed medication (*Specific-Necessity*) and concerns about prescribed medication based on beliefs about the danger of dependence, long-term toxicity, and the disruptive effects of medication (*Specific-Concerns*).The BMQ-General section comprises two 3-item factors assessing medicines that are *overused by doctors* (*General-Overuse*), assessing beliefs that medicines are harmful, addictive and poisonous and should not be taken continuously (*General-Harm*), and assessing beliefs that medicines help people live better, longer and outweigh risks*(General-Benefit scale)*.BMQ items were scored on a Likert-type scale: (score 1: strongly disagree, score 2: disagree, score 3: uncertain, score 4: agree, score 5: strongly agree), keeping in mind the reverse answers. A

h4tim@live.com*

mean item score was then calculated as the sum of each item score divided by the number of items (e.g., mean score of Specific-Necessity=(N1+N2+N3+N4+N5)/5). The Cronbach'sαs indicated that all scale measures were internally consistent in the study sample (15) with high values of αpsm=0.85, αconcern=0.75, and αnecessity=0.64, and low values of αoveruse=0.54, αharm=0.55, and αbenefit=0.58.

3) The third dependent variable: a Likert-type scale was used in the scoring of items about drug compliance in the BMQ. A pilot study was carried out (10% of the sample size (9subjects)) to evaluate the validity and reliability of the questionnaire given to participants to assess whether the Arabic version of the MARS, BMQ would be easily understood by Saudi patients. Feedback was wholly positive; however, some patients were likely to be elderly. Therefore, we provided help to patients who had any difficulty completing the questionnaire. The results of the pilot phase were not used in the final data analysis. Validation of the questionnaire was made as follows: the questionnaires were translated using a back-translation technique. An expert translated the original questionnaire from English into Arabic. The Arabic version of the questionnaires was translated back into English by a bilingual individual. The back-translated and original versions of the questionnaire were compared with attention given to meaning and grammar.

2.3 Ethical considerations

Ethical approval for the study was obtained from the ethical review committee of the King Fahad Hospital (300/275). The nature of the study was fully explained to the study participants and consent was obtained from them. All participants were allowed to respond at their convenience and available time and their privacy was secured.

3. STATISTICAL ANALYSIS

The collected data were coded, entered, presented and analyzed using a data base software program, Statistical Package for Social Science (version 20, SPSS Inc, Chicago, IL).Quantitative variables were expressed as the mean ± standard deviation (SD) while the qualitative variables were expressed as a number and percentage. The results were considered statistically significant when the significant probability (P value < 0.05*).

4. RESULT

Regarding MMAS results which measured the patients' adherence to the drugs used for MS, about 71.1% of them forgot to take medicine, as the majority (82.2%) had problems remembering to take medicine. However, most of them (76.6%&60%) did not stop the drug when they felt well or felt worse (table 2-1). The total score of MMAS found with mean±SD was (2.0167±0.98), and about 37.8% had a total score≥3, which is considered to be adherent to the drugs (table 3-1 and graph 1).This is a cross-sectional study aimed to assess adherence to medication among adults who are suffering from MS in Medina province, Saudi Arabia. The study included 90 patients from Medina province, Saudi Arabia, complaining of Multiple sclerosis; two of them did not complete the questionnaires, with a response rate of 97.78%, with an age of 36.13±9.58. Most of the participants were above 35 years and amajority of them (55%) were females, and 45.45% of the females were home makers. About 66.670% of the total patients had university education, and 2.2% of participants were unemployed Table (1-1). BMQ scale result is shown in table 3. The scale specific to MS drugs showed that about 44.4% of the patients depended on the drug in their lives, about (13.3%&24.2%) strongly agreed that the medication protected them from being harmed, (3.3%&34.4%) strongly agreed and agreed with the impossibility to live without medicine, and more than 40% confirmed that their future depended on it. While the scale measured the patients' concerns about drugs, nearly half of the patients worried about being dependent on the drug and more than half of them found that medication was a mystery to them (table 2-2). The total score of BMQ Specific-Necessity with mean±SD (3.25±0.704) and about 63.4% had a total score≥3 and a total score of BMQ Specific-Concerns with mean±SD (3.34±0.703), and about 84.4% had a total score≥3 (table 3-1 and graph 1). BMQ-General scales results were divided into three parts. General overuse (table 2-3) showed that the majority of patients believed that t doctors use too many drugs and they rely onmedicines, while the General harm scale results showed that most of the patients (24.4%&60%) believed in natural remedies more than drugs, However at the same time, the majority of them did not believe in addiction of these drugs. On the other hand, about (61.1%&84.4%) confirmed that medicine helps them to live better and live longer. The total score of BMQ General with a mean±SD (3.2727±0.310) and about 81.1% had a total score≥3 (table 3-1 and graph 1). Regarding patients' compliance toward use of medicine, nearly 40% of them worried about the cost of the drugs, and half of them said that taking other drugs affected their adherence to medicine and side effects of the drug (Table 2-4). The total score of compliance with mean±SD (3.2023±0.393) (table 3-1).Regarding the total score for demographic characteristics of patients as gender (table 4-1) showed no significant difference between male and female patients regarding the adherence total score, BMQ-Specific-Necessity, BMQ-General, Compliance total score and total BMG-Specific-Concerns score. There was no statistically significant difference between the demographic characteristics of patients regarding age and gender and whether the patient is adherent or not (p value>0.05).

Table (1-1). Basic characteristics of the studied group (n=90)

Basic characteristics	Study group (n=90)	
	No	%
Age Category (36.13±9.58)		
<35	44	48.89
>=35	46	51.11
Total	90	100.0
Gender		
Male	35	38.9
Female	55	61.1
Total	90	100.0
Education		
University	60	66.67
High school	20	22.22
Intermediate	4	4.44
Elementary	1	1.11
Uneducated	5	5.556
Total	90	100.00
Employment		
Unemployed	20	22.2
Employed	45	50
Homemaker (female)	25	27.8
Retired	0	0
Total	90	100.0
Marital Status		
Married	374	22.2
Unmarried	92	50
Widow	114	27.8
Total	580	100.0

Table (2-1). Morisky Medication-Taking Adherence Scale-MMAS among studied participants

Adherence Scale	Study group (n=90)	
	No	%
Do you ever forget to take your (multiple sclerosis) medicine?		
Yes	64	71.1
No	26	28.9
Total	**90**	**100.0**
Do you ever have problems remembering to take your (multiple sclerosis) medication?		
Yes	74	82.2
No	16	17.8
Total	**90**	**100.0**
When you feel better, do you sometimes stop taking your (multiple sclerosis) medicine?		
Yes	21	23.3
No	69	76.6
Total	**90**	**99.9**
If you feel worse when you take your (multiple sclerosis) medicine, do you sometimes stop taking it?		
Yes	36	40
No	54	60
Total	**90**	**100.0**

Table (2-2). Beliefs about medicines questionnaire specific to multiple sclerosis among the studied participants (BMQ-S)

Appendix (2) items		Study group (n=90)	
		No	%
Specific-Necessity 1) My health at present depends on my multiple sclerosis medicines.	Strongly agree	0	0
	Agree	40	44.44
	Uncertain	31	34.44
	Disagree	19	21.11
	Strongly disagree	0	0
	Total	90	100.00
2) My multiple sclerosis medication protects me from becoming worse.	Strongly agree	12	13.33
	Agree	22	24.4
	Uncertain	33	36.7
	Disagree	22	24.44
	Strongly disagree	1	1.11
	Total	90	100.0
3) My life would be impossible without my multiple sclerosis medication.	Strongly agree	3	3.33
	Agree	31	34.44
	Uncertain	34	37.8
	Disagree	22	24.44
	Strongly disagree	0	0
	Total	90	100.0
4) Without my multiple sclerosis medication, I would be very ill.	Strongly agree	8	8.89
	Agree	33	36.7
	Uncertain	24	26.7
	Disagree	24	26.7
	Strongly disagree	1	1.1
	Total	90	100.0
5) My health in the future will depend on my multiple sclerosis medication.	Strongly agree	4	4.44
	Agree	37	41.1
	Uncertain	36	40
	Disagree	13	14.4
	Strongly disagree	0	0
	Total	90	100.0
Specific-Concerns 6) Having to take multiple sclerosis medication worries me.	Strongly agree	4	4.4
	Agree	6	6.67
	Uncertain	0	0
	Disagree	47	52.2
	Strongly disagree	31	34.44
	Total	88	97.7
7) I sometimes worry about the long-term effects of my multiple sclerosis medication.	Strongly agree	5	5.6
	Agree	5	5.6
	Uncertain	10	11.11
	Disagree	37	41.11
	Strongly disagree	31	34.44
	Total	88	97.8
8) My multiple sclerosis medication disrupts my life.	Strongly agree	4	4.4
	Agree	7	7.8
	Uncertain	8	8.9
	Disagree	51	56.7
	Strongly disagree	18	20
	Total	88	97.8
9) I sometimes worry about becoming too dependent on my multiple sclerosis medication.	Strongly agree	15	16.7
	Agree	28	31.1
	Uncertain	7	7.8
	Disagree	18	20
	Strongly disagree	20	22.2
	Total	88	97.8
10) My multiple sclerosis medication is mystery to me.	Strongly agree	32	35.6
	Agree	46	51.1
	Uncertain	3	3.3
	Disagree	4	4.4
	Strongly disagree	3	3.3
	Total	88	97.7

Table (2-3). General beliefs about medicines questionnaire among thestudied participants (BMQ- G)

Appendix (2) Items		Study group (n=90)	
		No	%
General-Overuse scale: 11) Doctors use too many medicines.	Strongly agree	24	26.7
	Agree	53	58.9
	Uncertain	10	11.1
	Disagree	1	1.1
	Strongly disagree	0	0
	Total	88	97.8
12) Doctors place too much trust in medicines.	Strongly agree	18	20
	Agree	45	50
	Uncertain	15	16.7
	Disagree	10	11.1
	Strongly disagree	0	0
	Total	88	97.8
13) If doctors had more time with patients, they would prescribe fewer medicines.	Strongly agree	3	3.3
	Agree	22	24.4
	Uncertain	35	38.9
	Disagree	21	23.3
	Strongly disagree	7	7.8
	Total	88	97.7
The General-Harm scale: 14) Natural remedies are safer than medicines.	Strongly agree	22	24.4
	Agree	54	60
	Uncertain	12	13.3
	Disagree	0	0
	Strongly disagree	0	0
	Total	88	97.7
15) Most medicines are addictive.	Strongly agree	0	0
	Agree	0	0
	Uncertain	13	14.4
	Disagree	54	60
	Strongly disagree	21	23.3
	Total	88	97.7
16) People who take medicines should stop their treatment for a while every now and again.	Strongly agree	0	0
	Agree	8	8.9
	Uncertain	26	28.9
	Disagree	38	42.2
	Strongly disagree	16	17.8
	Total	88	97.8
17) Medicines do more harm than good.	Strongly agree	0	0
	Agree	8	8.9
	Uncertain	18	20
	Disagree	45	50
	Strongly disagree	17	18.9
	Total	88	97.8
The General-Benefit scale 18) "Without medicines, doctors Would be less able to cure people."	Strongly agree	18	20
	Agree	34	37.8
	Uncertain	15	16.7
	Disagree	21	23.3
	Strongly disagree	0	0
	Total	88	97.8
19) "Medicines help many people to live better lives."	Strongly agree	10	11.1
	Agree	45	50
	Uncertain	24	26.7
	Disagree	9	10
	Strongly disagree	0	0
	Total	88	97.8
20) "Medicines help many people to	Strongly agree	27	30

live longer."	Agree	49	54.4
	Uncertain	12	30
	Disagree	0	0
	Strongly disagree	0	0
	Total	88	114.4
21) "In most cases, the benefits of medicine outweigh the risks."	Strongly agree	8	8.9
	Agree	29	32.2
	Uncertain	29	32.2
	Disagree	22	24.4
	Strongly disagree	0	0
	Total	88	97.7

Table (2-4). Factors affecting patients' compliance among studied group

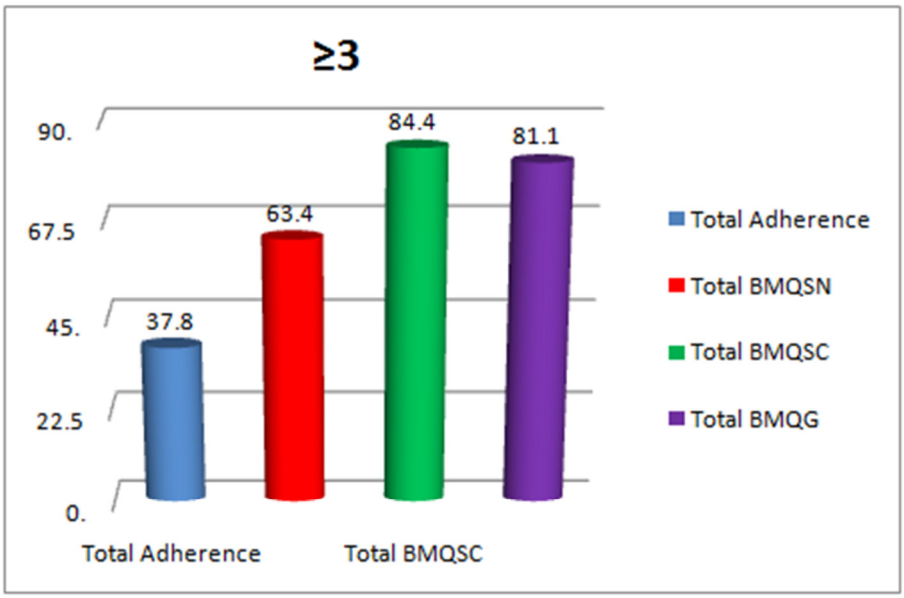
Appendix (3) items		Study group (n=90)	
		No	%
1) The cost of the drug affects my adherence to the medication.	Strongly agree	9	10
	Agree	27	30
	Uncertain	28	31.1
	Disagree	24	26.7
	Strongly disagree	0	0
	Total	88	97.8
2) Frequent medication (taking more than one pill a day) affects my adherence to the medication.	Strongly agree	11	12.2
	Agree	22	24.4
	Uncertain	28	31.1
	Disagree	26	28.9
	Strongly disagree	1	1.1
	Total	88	97.7
3) Taking other drugs (non- multiple sclerosis disease drugs) affects my adherence to the medication.	Strongly agree	9	10
	Agree	36	40
	Uncertain	26	28.9
	Disagree	17	18.9
	Strongly disagree	0	0
	Total	88	97.8
4) Side effects of drugs affect my adherence to the medication.	Strongly agree	33	36.7
	Agree	46	51.1
	Uncertain	9	10
	Disagree	0	0
	Strongly disagree	0	0
	Total	88	97.8
5) I do not get any benefit from medication, so I do not take it.	Strongly agree	2	2.2
	Agree	45	50
	Uncertain	41	45.6
	Disagree	0	0
	Strongly disagree	0	0
	Total	88	97.8

Table (3-1). Total score regarding adherence, BMQ-Specific, BMQ-General and to medicine

	Number	Mean	Standard deviation
Adherence score	90(100.0)	2.16	0.98
BMQ-Specific score (Necessity)	90(100.0)	3.25	0.70
BMQ-Specific score (Concerns)	88(97.8)	3.34	0.70
BMQ-General score	88(97.8)	3.27	0.31
Compliance score	88(97.8)	3.20	0.39

Table (4-1). Total score regarding adherence, BMQ-Specific, BMQ-General and Compliance to medicine among male and female

	Gender	N	Mean	Std. Deviation	p value
Adherence score	Male	35	2.11	0.83	0.57
	Female	55	2.20	0.78	
BMQ-Specific score (Necessity)	Male	35	3.29	0.73	0.99
	Female	55	3.22	0.69	
BMQ-Specific score (Concerns)	Male	35	3.56	0.66	0.07
	Female	53	3.49	0.73	
BMQ-General score	Male	35	3.33	0.27	0.08
	Female	53	3.23	0.32	
Compliance score	Male	35	3.26	0.42	0.23
	Female	53	3.16	0.36	



Graph 1.Bar chart show total score ≥3 regarding adherence, BMQ-Specific, BMQ- General and Compliance to medicine

5. DISCUSSION

MS is an immune-mediated disease of the central nervous system. Evidence on adherence to medication for MS patients in Saudi Arabia is lacking. This cross-sectional study aimed to assess adherence to medication among adults who suffer from MS in Medina province, Saudi Arabia. The study included 90 patients with a mean age of 36.13±9.58. Most of the participants were above 35 years and amajority of them (55%) were females. About 37.8% of the studied patients were considered to be adherent to the drugs. Different studies were conducted at different areas and revealed different adherence rates. The study by Kołtuniuk and Rosińczuk[16] reported that the overall adherence was 76.5%. Camera and Gondim's[17]study had identified an adherence rate of 46% according to the (MMAS-8). A multicentricstudy conducted in Spain health care centers by Fernandez et al. [18]for MS patients' evaluation found an adherence rate of 68%. These differences found in the adherence rates of these studies may be explained by the variables established to define adherence, and the different scales used, and the different sample sizes. Regarding MMAS results which measured the patients' adherence to the drugs used in MS, about 71.1% of them forgot to take medicine as the majority had problems remembering to take medicine.Camera and Gondim[17] reported that a patient's forgetfulness, which is an unintentional behavior, is an important reason for non-adherence. Patients with MS, forgetting to take the medication may be associated with alterations in thecognitive function, as reported by the National Multiple Sclerosis Society [19].Changes in cognitive functions are a very common symptom of MS that affects 62.4% of patients [20]. Other studies have also observed that the main cause of non-adherence reported by patients with MS was

forgetfulness, as reported by Devonshire et al.[21] These results agreed with Castello et al.[22] who reported that barriers to maintaining treatment adherence in patients with MS include forgetting the medication, injection anxiety, perceived lack of efficacy, and coping with adverse events.Regarding the patients' concerns about drugs, nearly half of the patients worried about being dependent on the drug, and more than half of them found that medication was a mystery to them**.** The majority of patients believed that doctors use too many drugs.As per the current study,about (61.1% &84.4%) confirmed that medicine helps them to live better and live longer. These results agreed with the study of Camera and Gondim[17] as they reported that (77.1%) of participants were intrinsically motivated to adhere to the treatment believing that immune-modulator medication avoids the disease progression (77.3%), hoping to avoid episodes (56.9%), and hoping to get better (42.1%).In the present study regarding patients' compliance towards medicine, half of the patients said that taking other drugs and side effects of the drug affected their adherence to medicine. In agreement with the current study were the results of Ibrahim and Deleu [4], as the majority (51%) of participants were in the age group (31-51) years, were female (54.9%), and unemployed (58.8%). They reported that the chronic condition of MS and fear of side effects from medication were the most reported reasons for noncompliance with medication.About 40% of the current study population worried about the cost of the drugs, and these results agreed with Simacek et al. [23]study in 2018, which reported that financial problems were an important reason for noncompliance with the treatment. Also, the study of Almazrouei et al. [24]reported thatthe management of patients with MS is highly costly, and this cost can increase the economic burden and cause no adherence. But these results do not agree with the study of Ibrahim and Deleu[4] which reported that financial problems were the least reported reason (19.6%) for noncompliance with medication. There was no statistically significant difference between the demographic characteristics of patients, such as age, gender, and whether the patient was adherent or not (p value>0.05).These results agreed with an Evans et al. [25] study in 2016, which reported that age, sex, and socioeconomic status were not associated with adherence to MS treatment. But the study of Higuera et al. [26] reported that older patients and males were more adherent to drugs than younger patients and females.

6. CONCLUSION

We concluded that many factors affected the patient's adherence to the drug rather than of being dependence to the drugs as worrying about side effects and the cost of the drug.

7. AUTHORS CONTRIBUTION STATEMENT

Hatim Muhammad H Alshalahi designed main conceptual ideas and proof outline. Salma Moteb and analysed the data and Sara Moteb collected the data . All authors discussed the results and commented on the manuscript. Hatim Muhammad and Salma Moteb drafted the manuscript by help of DR.Abid M Kareem.

8. CONFLICT OF INTEREST

Conflict of interest declared none.

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