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# Assessment of Rheumatoid Arthritis Patients' Adherence to Treatment

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**Abstract:** *Background:* Reports on adherence among patients with rheumatoid arthritis (RA) in Egypt and the Middle East region are lacking. This study aimed to measure adherence to treatment among a sample of patients with RA at Ain Shams University Rheumatology outpatient clinic and to assess factors affecting it. *Methods:* A cross-sectional descriptive study was carried out at the rheumatology outpatient clinic on a sample of 140 patients with RA. An interview questionnaire was used to measure adherence using the 8-item Morisky's scale, factors affecting adherence to treatment like patients satisfaction were assessed using the short form patient satisfaction questionnaire, also patients' knowledge, beliefs and rate of prescription refilling were assessed. Disease Activity Score—28 was used as an objective method to assess RA disease activity. *Results:* According to Morisky's scale, 90.6% and 9.4% were classified as low and moderately adherent, respectively, none was classified as highly adherent to treatment. Important barriers to adherence reported were fear of side effects, nonavailability of free drugs in hospital pharmacy and cost of medications. Younger patients ( $P = 0.002$ ) and those reporting greater general satisfaction ( $P = 0.02$ ) were more likely to be adherent. In addition, on-time refill rates of medication ( $P = 0.001$ ) and disease activity ( $P = 0.02$ ) were associated with higher adherence scores and thus further validated the results of the adherence questionnaire. *Conclusions:* Higher adherence was associated with more positive beliefs on medication, greater satisfaction with health care and less disease activity.

**Key Indexing Terms:** Rheumatoid arthritis; Barriers to adherence; Morisky's scale; Patient satisfaction. [Am J Med Sci 2015;349 (2):151–156.]

Rheumatoid arthritis (RA) is a chronic, progressive, incapacitating disease that needs uninterrupted therapy with many medications.<sup>1,2</sup> Functional disability is considerably reduced with efficient management of RA in this respect drug efficacy and patient adherence with the treatment prescribed is equally important.<sup>3–5</sup> Adherence to a medication regimen is “the extent to which patients take medications as prescribed by their health care providers.”<sup>1</sup> Another definition is “the extent to which a person's medication-taking behavior coincides with medical advice.”<sup>6</sup>

Nonadherence is a universal widely prevalent phenomenon; it increases the risk of unnecessary changes in treatment and causes preventable morbidity, mortality, loss of productivity and loss of health care resources like more visits to

physicians and to emergency department and more hospital admissions.<sup>7</sup>

Adherence to medical treatment in patients with RA is not well understood as compared with other chronic diseases such as asthma and diabetes due to scant data.<sup>5</sup> Adherence rates in RA have ranged from 30% to 93% in different studies.<sup>5,7</sup>

Higher adherence rates are observed among patients with acute conditions, as compared with those with chronic conditions; adherence among patients with chronic conditions is unfortunately low and falling intensely after the first 6 months of therapy.<sup>8,9</sup> In patients with nonadherent RA, the risk of a disease progression and activity has been found to increase significantly.<sup>4</sup>

Adherence to therapy is an individual patient behavior that is difficult to objectively measure.<sup>10</sup> The 8-item Morisky's scale is supplemented with additional items addressing the circumstances surrounding adherence behavior and is a commonly used self-reported adherence measure that has been shown to be predictive of adherence.<sup>11</sup> Common barriers to adherence as identified from surveys can be related either to patients or physicians. The most common reasons cited by patients for not taking their medications included forgetfulness, other priorities, decision to omit doses, lack of information and emotional factors.<sup>12</sup> In addition, physicians contribute to patients' poor adherence by poor interaction with their patients and by prescribing complex regimens and not appropriately explaining the benefits and side effects of the drugs to their patients. Also, physician should put in consideration the patient's lifestyle and the cost of the medications when prescribing a certain regimen. An expanded view of barriers must include access to health care and its cost as well.<sup>13,14</sup>

To improve adherence among RA patients' barriers should be identified and appropriate interventions tailored. Scarce data and studies are available on RA patients' adherence in Middle East and North Africa region.<sup>15</sup> According to our knowledge, there were no studies on adherence among Egyptian patients with RA. The aim of this study was to measure adherence rate in patients with RA attending Ain Shams University Rheumatology outpatient clinic and to assess factors affecting it.

## METHODS

### Study Design

This is a descriptive study followed by analysis of factors affecting adherence among patients attending Ain Shams University Rheumatology outpatients' clinic.

### Study Population and Sample Size

Patients eligible for participation in the study needed to be at least 18 years old, diagnosed with RA according to ICD-10 and having duration of illness of at least 1 year.

Two hundred patients were registered in the rheumatology outpatient clinic at Ain Shams University. Using Epi Info statistical package version 7 for cross-sectional study, the total number of patients with RA registered is 200. Expected

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TABLE 1. Demographic characteristics of study respondents

	Frequency (n = 140)	Percentage
Age (y)		
Mean ± SD (range)	45 ± 9 (23–65)	
Gender		
Male	9	6.4
Female	131	93.6
Residency		
Outside Cairo	21	15
Inside Cairo	119	85
Education		
Illiterate	56	40.0
Read and write	19	13.5
Primary school	26	18.6
Preparatory/secondary school	33	23.6
University degree	6	4.3
Marital status		
Single	3	2.1
Married	131	93.6
Divorced/widowed	6	4.3
Occupation		
Nonemployed	111	79.2
Employed	29	20.8

frequency of adherence rate among patients with RA as revealed from a Jordanian study is 65%.<sup>12</sup> Calculation of sample size at 95% confidence interval and power of test 80%, revealed that at least 127 were required and after adjusting for 10% dropout, a sample size of 140 patients with RA was suggested. The Ain Shams University rheumatology outpatients' clinic opens 2 days per week and all patients who attended this outpatients' clinic between May 2012 and December 2012 and met the eligibility criteria were consecutively included in the this study.

### Study Tool

An interview questionnaire was used to collect data covering the following items.

Part I: sociodemographic data, clinical and medication data directly obtained from patients and from their medical records.

Part II was a medication adherence test using a licensed Arabic version of the validated 8-item Morisky's Medication Adherence Scale (MMAS-8), in addition to data on prescription refilling and reasons of nonadherence from patient view.

The MMAS-8 has 7 questions having a binary answer and 1 question answered on a 5-point Likert's scale. It is a widely used instrument to measure self-reported medication-taking behavior. It has been validated linguistically in several languages and undergone criterion-related validation, construct validation and convergent validation. The MMAS-8 is an ordinal scale with a range from 0 to 8, and its scoring can be obtained from the developer/owner. According to the MMAS-8 scoring system, patients who had a low or a moderate rate of adherence were considered as nonadherent. Persons are classified as low adherers if they have <6 points, medium adherers if they have 6 to 7 points and high adherers if they have 8 points.<sup>11</sup>

Part III measured factors affecting adherence such as: Patient knowledge is an index measure and was assessed using

TABLE 2. Duration of disease and medications taken and adherence among study respondents

	Frequency (n = 140)	Percentage
Duration of disease (y)		
Mean ± SD (range)	7 ± 5 (2–20)	
Duration of medications use (y)		
Mean ± SD (range)	7 ± 4 (2–19)	
Disease activity		
Remission	27	19.3
Low activity	20	14.3
High activity	93	66.4
Medications taken <sup>a</sup>		
NSAIDS	140	100.0
Hydroxychloroquine	128	91.4
Folic acid	105	75.0
Methotrexate	105	75.0
Calcium	120	85.7
Glucocorticoids	120	85.7
Biologic drugs	0.00	0.0
Rate of prescription refilling		
Late	106	75.7
On time	34	24.3
Morisky's scale adherence rate		
Moderate adherence	127	90.7
Low adherence	13	9.3

<sup>a</sup> Multiple drugs intake by each patient.

a 4-item questionnaire answered as "correct," "incorrect" and "don't know" and the "don't know" was scored as incorrect, patient beliefs assessed using 4 items questionnaire answered on a 3-point Likert's scale and patient satisfaction was assessed using short form patient satisfaction questionnaire answered on 5-point Likert's scale.<sup>16</sup>

Part IV consisted of an objective method to measure adherence using Disease Activity Score (DAS-28 version 3) by DAS calculator, which measured disease activity by entering the number of tender joints, swollen joints and erythrocyte sedimentation rate value. After a complex calculation made by DAS-28 calculator, the results fall into one of the following categories:

1. DAS-28 >5.1 = high disease activity.
2. DAS-28 <3.2 = low disease activity.
3. DAS-28 <2.6 = remission.

The DAS score was originally developed by Dutch rheumatologists to standardize and compare results in clinical trials of new drugs for treating RA. Presently, the DAS-28 has also been applied to daily clinical practice.<sup>17</sup>

The DAS-28 used in this study was performed by the examining physician on the same day of the interview.

### Ethical Consideration

Approval of study conduction was obtained from the Ethical Review Committee at the Faculty of Medicine, Ain Shams University. Administrative approvals from the director of outpatient clinics of Ain Shams university hospital and head of Rheumatology department were obtained. In addition, the purpose of this study was explained to all participants and confidentiality was assured, a verbal informed consent was obtained and the survey tool was anonymous.

TABLE 3. Adherence items among study participants by MMAS-8\*

Adherence items	Frequency (n = 140)	Percentage
Sometimes he or she forgets to take RA medication(s)	80	57.1
People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past 2 wk, any days he or she did not take RA medication(s)	93	66.4
Ever cut back or stopped taking medication(s) without telling the doctor, because felt worse when he or she took it	58	41.4
When traveling or leaving home, sometimes he or she forgets to bring along RA medication(s)	98	70.0
He or she has taken his RA medication (s) yesterday	120	85.7
When he or she feels like RA is under control, sometimes stops taking his medication(s)	38	27.1
Taking medication(s) everyday is a real inconvenience for some people. Ever felt hassled about sticking to his high RA treatment plan	133	95.0
How often do you have difficulty remembering to take all your medication(s)?		
All the time	3	10.0
Sometimes	6	4.3
Usually	47	33.6
Once in a while	15	10.7
Rarely	68	48.6

\* Use of the MMAS is protected by U.S. copyright laws. Permission for use is required. A license agreement is available from Donald E. Morisky, ScD, ScM, MSPH, Professor, Department of Community Health Sciences, UCLA School of Public Health, 650 Charles E. Young Drive South, Los Angeles, CA 90095 to 1772. Adaptations are themselves works protected by copyright. So in order to publish this adaptation, authorization must be obtained both from the owner of the copyright in the original work and from the owner of copyright in the translation or adaptation.

**Data Management and Statistical Analysis**

Data were collected by the researcher through a structured interview using the above-mentioned questionnaires. Data were analyzed using SPSS version 12.

Descriptive statistics and graphical displays were used to describe the sample population. Frequency tables and charts were used to describe nominal and ordinal variables. Continuous variables were described using distributions, mean values and SDs. The  $\chi^2$  tests were used to compare nominal and ordinal variables, and student's *t* tests were used to compare mean values of continuous variables.

**RESULTS**

The majority (93.6%) of study participants was married females living in Cairo, and the mean age was (45 ± 9 years); 40% were illiterate, 79.2% were nonemployed and all non-employed were housewives (Table 1).

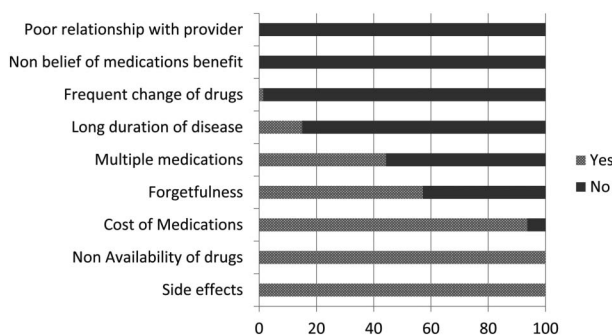


FIGURE 1. Reasons for patients' nonadherence to medications.

The mean duration of disease and medication use was 7 ± 5 years and 7 ± 4 years, respectively, and 75.7% of patients reported late refilling of their prescriptions. All study participants (100%) were taking nonsteroidal anti-inflammatory drugs (NSAIDs), and none was taking biologic drugs. All patients were taking at least 1 disease-modifying antirheumatic drugs. According to MMAS-8, 90.7% of study participants were low adherent and 9.2% were moderately adherent (both low and moderate adherence are considered nonadherent), and no patients scored "high adherence" (Table 2).

More than half (57.1%) of respondents sometimes forget taking their medications, 66.4% intentionally miss dosage, 70% forget bringing medications while traveling, 85% took their medications the day preceding the survey and 95% feel hassled sticking to treatment (Table 3).

All respondents (100%) reported side effects of medications and nonavailability of free drugs in hospital pharmacy as a reason for nonadherence. This was followed by cost of medications and forgetfulness accounting for 93.6% and 57.1%, respectively (Figure 1).

The majority (87.1%) of study participants believed that RA treatment make them feel better and 61.4% believed that treatment improves quality of life, whereas 100% did not

TABLE 4. Beliefs of patients with RA concerning medications

Do you think that RA medications	Frequency (n = 140)	Percentage
Will make you feel better		
Disagree	2	1.4
Uncertain	16	11.4
Agree	122	87.1
Will make you live longer		
Disagree	140	100.0
Uncertain	0	0.0
Agree	0	0.0
Will improve the quality of life		
Disagree	2	1.4
Uncertain	52	37.1
Agree	86	61.4
Will prevent future RA-related complications		
Disagree	55	39.3
Uncertain	72	51.4
Agree	13	9.3

TABLE 5. Factors affecting adherence among study respondents

Variable	MMAS-8		Test of significance
	Low adherence (n = 127) (%)	Moderate adherence (n = 13) (%)	
Age <sup>a</sup> (mean ± SD)	46.8 ± 9.01	36.9 ± 8.62	<i>t</i> test = 14.8; <i>P</i> = 0.002
Duration of disease <sup>a</sup> (mean ± SD)	7.5 ± 4.5	3.15 ± 1.6	<i>t</i> test = 7.15; <i>P</i> = 0.001
Duration of medication <sup>a</sup> use (mean ± SD)	7.0 ± 4.5	3.0 ± 1.4	<i>t</i> test = 6.7; <i>P</i> = 0.001
Knowledge score <sup>a</sup> (mean ± SD)	12.2 ± 5.4	13.7 ± 6.7	<i>t</i> test = 0.9; <i>P</i> = 0.4
Beliefs score <sup>a</sup> (mean ± SD)	11.5 ± 7.4	18.1 ± 10.1	<i>t</i> test = 2.9; <i>P</i> = 0.004
Rate of prescription refilling <sup>a</sup>			
Late	101 (79.5)	5 (38.5)	$\chi^2 = 10.8$ <i>P</i> = 0.001
On time	26 (20.5)	8 (61.5)	
Disease activity <sup>a</sup>			
Remission	24 (18.9)	3 (23.0)	$\chi^2 = 7.6$ <i>P</i> = 0.02
Low activity	15 (11.8)	5 (38.5)	
High activity	88 (69.3)	5 (38.5)	

<sup>a</sup> *P* < 0.05.

believe that treatment can make them live longer and 39.3% of them did not think that treatment can prevent future RA complications (Table 4).

Moderately adherent study participants were significantly younger, had a lower mean duration of disease and they reported more on-time rate of prescription refilling. Also a significantly higher score was found among moderately adherent respondents concerning patients' knowledge and beliefs about RA. In addition, a significantly higher disease activity as measured by DAS- 28 version 3 was found among low-adherent group (Table 5).

General satisfaction score, communication and time spent with doctor were significantly higher among moderate adherence group (*P* < 0.05) (Table 6).

## DISCUSSION

Patients participating in this study attended the outpatient rheumatology clinic at Ain Shams University Hospital. This study measured adherence rate using the 8-item Morisky's scale (MMAS-8) and showed that 90.7% of study participants had low adherence and 9.3% had moderate adherence and none was highly adherent to RA treatment. A Jordanian study conducted at King Hussein Medical Center in 2007 using a specially designed questionnaire showed that 38 patients (35.0%) of 110

patients with RA did not adhere to their medications.<sup>15</sup> The discrepancy between our finding and the Jordanian study may be due to the fact that the latter study used a self-report method that tends to overestimate adherence and was not a standardized tool. Another cross-sectional study done by Bart et al, 2009, in the Netherlands that investigated 629 patients with RA using 2 tools, compliance questionnaire Rheumatology and Medication Adherence Scale revealed that 68% and 60% of patients were adherent by compliance questionnaire Rheumatology and Medication Adherence Scale, respectively.<sup>18</sup> There is no gold standard method to evaluate patients' adherence to medication, every method has its pros and cons.<sup>2,19</sup> Data from self-report studies present variable adherence rates from 30% to 93%.<sup>5,7</sup>

Adherence can be described as a balance between patients' beliefs about the necessity of the treatment and their concerns about its side effects.<sup>20</sup> Horne et al<sup>21</sup> suggested that patient beliefs about medications are an important factor in adherence. These study findings showed that moderately adherent respondents had significantly higher beliefs score of the importance and benefits of RA medications compared with low-adherent patients. Similarly, they reported greater satisfaction with health care as detected using the short form (PSQ-18). These findings agree with those reported by Treharne et al,<sup>22</sup> which showed that a belief about the importance of medications was associated with better medication adherence. Similarly,

TABLE 6. Relation of RA patients' satisfaction using PSQ-18 to adherence to treatment

Variable	MMAS-8		Test of significance
	Low adherence (n = 127) (%)	Moderate adherence (n = 13) (%)	
General satisfaction <sup>a</sup> (mean ± SD)	5.6 ± 1.0	6.3 ± 0.4	<i>t</i> test = -2.2; <i>P</i> = 0.02
Technical quality (mean ± SD)	11.8 ± 1.5	11.4 ± 1.6	<i>t</i> test = 0.8; <i>P</i> = 0.4
Interpersonal manner (mean ± SD)	5.3 ± 1.1	5.4 ± 0.8	<i>t</i> test = -0.2; <i>P</i> = 0.8
Communication <sup>a</sup> (mean ± SD)	3.4 ± 0.7	4.3 ± 0.6	<i>t</i> test = -4.0; <i>P</i> = 0.000
Financial aspect (mean ± SD)	5.1 ± 1.2	5.0 ± 1.1	<i>t</i> test = 0.2; <i>P</i> = 0.7
Time spent with doctor <sup>a</sup> (mean ± SD)	5.1 ± 1.1	6.2 ± 1.4	<i>t</i> test = -3.5; <i>P</i> = 0.000
Accessibility and convenience (mean ± SD)	14.1 ± 0.8	13.9 ± 0.6	<i>t</i> test = 0.6; <i>P</i> = 0.5

<sup>a</sup> *P* < 0.05.

another study done by Home et al<sup>23</sup> indicated that people with strong beliefs in the necessity of taking medication to maintain their health are found to be more adherent to treatment.

Other studies showed that a good relationship between the patient and health care provider, which features encouragement and reinforcement from the provider, has a positive impact on adherence. Poor provider communication concerning the benefits, instructions for use and side effects of medications can also contribute to low adherence, especially in older adults with memory problems.<sup>24,25</sup> In the same way, the findings of an Indian study that aimed to measure the effect of education on adherence to recommended management in a prospective 24-week controlled study in 2 tertiary care hospitals showed that at the end of the study, the proportion of patients adhering to the follow-up and all medications was significantly higher in intervention group with significantly lower DAS-28 score.<sup>26</sup>

The most common reported barriers to adherence in our study were fear of side effects, nonavailability of drugs for free in hospital pharmacy and medications cost, which corroborates with other studies.<sup>27,28</sup> This study was conducted in Ain Shams University Hospital in which the clinical services are offered for free. No fees are paid to see a physician. In the past, the university hospitals used to offer the prescribed drugs for free as well but this is not the case nowadays. When study participants were asked for reasons of nonadherence to prescribed medications, 100% of them reported nonavailability of free drugs in the pharmacy as a reason as they were expecting to be examined and offered the prescribed drugs for free. In addition, 93.6% of them reported high cost of medications as a reason as all patients have to buy drugs, in Egypt out of pocket expenditure on health care constitutes more than 60% of total health expenditure according to 2007/2008 National health accounts and most of patients coming to University Hospitals outpatient clinics are self-funded as they are not covered by any type of medical insurance as a result they have to purchase prescribed drugs that sometimes are really expensive especially if they are imported ones.<sup>29</sup> This finding goes hand in hand with Harrold et al<sup>30</sup> study of an elderly American population covered by insurance, the study have identified cost as the reason for medication nonadherence.

In this study, the increased duration of disease was significantly related to low adherence, which is consistent with other study results that showed that adherence to medications decreases with time.<sup>2,18</sup> In this study, younger patients reported more adherence with RA treatment. This finding contradicts with other studies, which showed that older age has been associated with greater medication adherence.<sup>10,31,32</sup> However, many studies found that sociodemographic characteristics did not significantly influence medication adherence.<sup>18,32-34</sup>

Our findings showed that on-time refill rates of medication and disease activity using DAS-28 version 3 were associated with higher MMAS-8 scores and thus further validated the results of the MMAS-8 adherence questionnaire.

### Limitations

There are, however, certain limitations to this study. First, the relatively small sample size is not powered to detect small differences between groups. Therefore, there is a need for further studies with larger sample size including a larger number of participants and more representative samples with respect to gender. As our study sample is mostly females, our results are only generalizable to women. Second, the cross-sectional study design only permits correlational analyses and causality cannot be inferred. Finally, there is a risk of response bias as the measures rely on self-reporting. Studies that include

larger samples of patients with more demographic and clinical data are needed.

### CONCLUSIONS

Using a validated standardized adherence questionnaire has several advantages over other tools. It is easier to perform, inexpensive and provides relatively accurate measure. This is the first study to assess adherence and satisfaction among Egyptian patients with RA using validated tools, in addition to using the disease activity score (DAS-28 version 3) as an objective accurate measure to assess whether RA is well controlled or not. This study showed that higher adherence was associated with more positive beliefs on medication, greater satisfaction with health care and less disease activity.

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