Assessment of Morisky Medication Adherence scale (8-MMAS) in a sample of Iraqi type 2 diabetic patients

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Abstract

Background: Low patients compliance to prescribed medications is an important and complex problem; Non-compliance imposes a considerable health care and financial burden on the health system.

Objectives: To assess the drug adherence in a sample of Iraqi patients with type 2 diabetes mellitus on oral hypoglycemic agents, using 8-item Morisky Medication adherence scale.

Patients and methods: A cross sectional questionnaire based study enrolled 300 type 2 diabetes patients; held in the National Diabetes Center (NDC)/ Al-Mustansiriyah University, Baghdad – Iraq; from January 2015 through April 2015.Patients' adherence to Oral medication was assessed using Morisky 8-item medication adherence scale (MMAS-8).

Results: No significant difference in mean Morisky score was obtained between male and female patients ($P>0.05$). Education level had a highly significant impact on mean Morisky score, ($P<0.001$). Residency of patients also had a highly significant effect of Morisky score ($P<0.001$); It was very clear that patients living in rural areas had higher score than patients living in urban areas; the score of patients from rural area was 7.14±10.5 while the score of patients from urban area was 6.61±1.23.

Conclusion: The study concluded that low/ moderate drug adherence of diabetes among the diabetic patients, which need more effort and role to be played by clinical pharmacist to fulfill this gap.

Keywords: Morisky scale, Type 2 diabetes mellitus.

Introduction

Diabetes mellitus is a combination of heterogeneous disorders commonly presenting with episodes of hyperglycemia and glucose intolerance, as a result of lack of insulin, defective insulin action, or both [(1)].

Diet, life style modification and insulin replacement by exogenous insulin or oral hypoglycemic agents (OHA) are considered the cornerstone for the type 2 diabetes management [(2).]

Low compliance to prescribed medications is an important and complex problem, especially for patients with a chronic illness. Poor compliance may have a major impact on clinical outcome. Medical non-compliance imposes a considerable financial burden upon modern health care systems [(3).]

The lack of adequate solid data and studies about the adherence and the knowledge, attitude and practice background of type 2 diabetes Iraqi patients were the reason to conduct the present study; therefore the aim of the present study was:

To assess the drug adherence of a sample of type 2 diabetes Iraqi patients treated with oral hypoglycemic agents by 8-item Morisky drug adherence scale.

Patients and Methods:

A cross sectional questionnaire based study enrolled a random sample of 300 type 2 diabetes patients were conducted in the National Diabetes Center (NDC) 1 Al-Mustansiriyah University, Baghdad, Iraq for the period January -April 2015. Patients' adherence to Oral hypoglycemic agents was assessed using Morisky 8-item medication adherence scale (8-MMAS). The study was approved by scientific research committee of National Diabetic Center (NDC) of Al- Mustansiriyah University (Appendix II). The detailed Morisky Medication Adherence Scale (8-MMAS) is shown in Appendix I [(5)]. Statistical analysis was performed using (IBM® SPSS® V. 20) software and Microsoft Office Excel 2007. Numeric variables were expressed as mean±SD and 95% confidence intervals while nominal variables were expressed as number and percent. For purpose of comparison Chi-square test, student t-test and one way ANOVA were used. P-value was considered significant when it was less than 0.05.

Results:

Mean age of the diabetic patients enrolled in the present study was 52.48±8.17 years and the mean duration since time of diagnosis was 7.35±4.5 years. Out of 300 patients, 139 (46.3%) were males while 161 (53.7%) were females; the male/female ratio was 0.86:1. According to educational level patients were categorized as follows: 132 (44.0%) were illiterate, 78 (26%) had secondary school education while 90 (30.0%) had higher education. Regarding patients' residency, majority of patients were from urban areas accounting for 211 (70.3%), while only 89 (29.7%) were from rural areas. One hundred sixty seven patients (65.7%) were without job and the rest of patients, 133 (44.3%) had job. About one third of the

study sample patients were smokers (100 patients) and the rest were non-smokers (66.7%), table 1.

Table.1: The demographic characteristic of study population

Variables		n	%
Gender	Male	139	46.3
	Female	161	53.7
Education	Illiterate	132	44.0
	Secondary	78	26.0
	College	90	30.0
Residency	Rural	89	29.7
	Urban	211	70.3
Occupation	Jobless	167	55.7
	Job	133	44.3
Smoking	Non-smoker	200	66.7
	Smoker	100	33.3
	Total	300	100.0

Mean HbA1c was 9.17±1.5.No significant difference in mean Morisky score was obtained between male and female patients (*P*=0.488).Education level had a highly significant impact on mean Morisky score, (*P*=0.0001), in such a way that illiterate patients had the highest score while patients with higher education had the lowest score and patients with secondary education falling in between. Residency of patients also had a highly significant effect of Morisky score (*P*=0.0004);It was very clear that patients living in rural areas had higher score than patients living in urban areas; the score of patients from rural area was 7.14±10.5 while the score of patients from urban area was 6.61±1.23.
Occupation also had highly significant impact on mean Morisky score (P=0.0067); Jobless patients had higher score in comparison with patients with job; 6.93±1.23 versus 6.55±1.15. Smoking has no significant effect on Morisky score (*P*>0.407), as shown in table 2**.**Age has no significant effect on Morisky score (P>0.05), table 3**.**

Table 2: The mean±SD (95% CI) of MMAS-8 score for studied demographic groups

Characteristic		Mean	SD	95% CI	P value (t-test)
Sex	Male (n=138)	6.71	1.27	6.54 - 6.89	0.488621
	Female (n=162)	6.81	1.15	6.63 -6.99	
Education	Illiterate (n=131)	7.12	0.98	7.11 - 7.12	0.0001* (F=13.40)
	Secondary (n=77)	6.72	1.41	6.58 - 6.86	
	College (n=92)	6.3	1.17	6.09 - 6.50	
Residency	Rural (n=88)	7.14	1.05	7.14 - 7.15	0.000456
	Urban (n=212)	6.61	1.23	6.43 - 6.79	
Occupation (Job)	Jobless (n=166)	6.93	1.23	6.93 - 6.94	0.006722
	Job (n=134)	6.55	1.15	6.41 - 6.70	
Smoking	Non-smoker (n=200)	6.72	1.26	6.72 - 6.73	0.407627
	Smokers (n=100)	6.85	1.08	6.73 - 6.96	

*One way ANOVA

Table 3: The mean±SD (95% CI) of MMAS-8 score for studied age groups.

Parameter	< 40 years	41 - 50 years	51 - 60 years	> 60 years
n	24	96	131	49
m	6.66	6.61	6.86	6.87
SD	1.04	1.02	1.23	1.52
95% CI	6.65 - 6.68	6.53 - 6.69	6.64 - 7.07	6.70 - 7.05

ANOVA: F= 0.9677, P= > 0.05 (insignificant statistical probability)

Additionally duration of disease had no significant impact on Morisky scale (P>0.05), table 4**.** Majority of patients enrolled in the present study had Low to moderate adherence for their drug, accounting for (98.64%). No patient showed high adherence while only (1.36%) had medium adherence**,** as shown in table 5.

Table 4: The mean±SD (95% CI) of MMAS-8 score according to duration of diabetes

Parameter	< 5 years	5 - 10 years	11- 15 years	> 15 years
n	84	151	36	29
m	6.75	6.72	7	6.79
SD	0.95	1.26	1.28	1.49
95% CI	6.74 - 6.75	6.71 - 6.72	6.98 - 7.01	6.77 - 6.81

ANOVA: F= 0.5203, P= > 0.05 (insignificant statistical probability)

Table 5: Adherence degree of study population as measured by MMAS-8 Patients distribution according to interpretation of Morisky score

Degree of adherence	**Morisky's score**	**No. of patients**	**Percentage of patients**
High adherence	0	0	0.00
Medium adherence	1	2	0.66
Medium adherence	2	2	0.66
Low adherence	3	3	1.00
Low adherence	4	2	0.66
Low adherence	5	25	8.33
Low adherence	6	73	24.33
Low adherence	7	99	33.00
Low adherence	8	94	31.33
Total		300	100.00

Discussion:

Our study showed mean of Morisky score 6.77. None of the patients had high adherence and only 1.32% had medium adherence; while the majority of patients (98.68) had low adherence score.

These results reflect the poor adherence of our patients to their oral hypoglycemic drugs. This finding is further solidified by lack of patients with high adherence and a minority of patients with medium adherence. This result may be attributable to the low level of education of patients participating in the present study as illiterate people accounted for 44% of patients. Low education may render the patient unaware about the benefit of drug adherence and unaware about the long term complications of diabetes. Another cause which could be blamed as a factor for low adherence is the prolonged period of treatment which is bothersome for most of the patients.

Morisky scale was used to assess the adherence of Iraqi type 2 diabetes patients for the first time in our study and shows similar results to those foundby Lee *et.al.* (2013) in Korea which was 6.75[4] and the mean Morisky score of 6.13 which reported by Al-Qazaz*et.al.* (2010)[5].

The present study showed that mean Morisky scale was not related to variation in gender. This may attributable to the minimal variation in education level between male and female patients or may be due to similarity in beliefs regarding treatment of diabetes. The lack of variation in Morisky score in relation to gender was also reported by Al-Qazaz*et.al.*[5], 2010, Chua *et.al.*, 2013[6],and Lee *et.al.*, 2013[4].

Morisky score was significantly lower in educated people reflecting a better adherence in comparison with illiterate patients. This finding is expected as education increases awareness of patients regarding future complications of the disease and renders them more receptive to the prolonged period of treatment. Despite the opposite conclusion found by Lee *et.al.* (2013)[4]Whoreported lack of significant variation in Morisky scale in relation to education level; this may be attributable to higher level of education in Korean community in comparison to Iraqi community or may be due to better education programs about drug adherence and disease morbidity that are adopted by health care institutes in Korea. Al-Qazaz*et.al.*(2010) [5]reported a significant variation of Morisky scale in relation to education level ,in agreement with our results.

Rural patients reported higher Morisky score in comparison to those living in urban areas. This may attributable to better educational level of patients living in urban area or may be due to difficulty in obtaining medications by patients living in rural areas.

Morisky scale was higher in employed patients in comparison with those without job. This may be attributable to a financial cause as those without job may find difficulty in maintaining adequate quantity of anti diabetic drugs. While, Al-Qazaz*et.al.*,2010[5]and Chua *et.al.*, 2013 [7] found that Morisky score has no relation to employment. This may be explained by the adoption of better health insurance system by those countries regarding diabetes in comparison to Iraq.

Smokers have significantly higher Morisky scale than no-smokers in the present study, a fact that may be related to less awareness about the long term complications of diabetes experienced by smokers.

Age of patients and duration of disease did not affect Moisky scale in the present study, similar to what were founded byAl-Qazaz*et.al.*, 2010[5], Sweileh*et.al.*[7], 2014andChua *et.al.*[6], 2013 Who found insignificantassociation between score of Morisky and age of patients.

Conclusions:

The study concluded that low/ moderate drug adherence among Iraqi sample of type 2 diabetes patients, which need more effort and role to be played by clinical pharmacist to fulfill this gap.

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