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Assessment of Adherence to Refills and Medication Self-Administer in Patients with Type 2 Diabetes Mellitus

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ABSTRACT

Objective(s): To assess the Adherence to Refills and Medication Self-Administer in patients with type 2 diabetes.

Methods: A descriptive study conducted among (110) patients with type 2 diabetic mellitus in Baghdad Teaching Hospital / Medical City Department, and Imam Ali Hospital / Al-Rusafa Health Department between October 10th to June 15th, 2023. A convenient (non-probability) sampling was used to achieve the objectives of the study. Adherence to Refills and Medication Self-Administer was assessed using Adherence to Refills and Medications Scale.

Result: The results shown that the majority of the participants in the study were married women whose age ranges between (50 years) and above, with a primary education primary school graduate. The study found that patients, on average, refilled their medications less frequently than the recommended level (cut-off point of 16). The overall average score was 27.93, which is above the cut-off point.

Conclusions: The study concludes that more than half of the sample did not adhere to refilling the medication for type 2 diabetes patient. Adherence to medications has a direct, one-way effect on patients with type 2 diabetes.

Recommendations: The study encouraging guidance units to establish educational workshops and seminars for patients about diabetes medications and the importance of refilling and self-administering according to a daily schedule.

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تقييم الالتزام بإعادة تعبئة والادخال الذاتي للادوية لمرضى السكري من النوع الثاني

المستخلص

الاهداف: لتقييم الالتزام بإعادة التعبئة والادخال الذاتي للأدوية لمرضى السكري من النوع الثاني.

المنهجية: أجريت دراسة وصفية على (١١٠) مريضاً مصاباً بداء السكري من النوع الثاني في مستشفى بغداد التعليمي / دائرة مدينة الطب ومستشفى الامام علي / دائرة صحة الرصافة في الفترة من ١٠ تشرين الأول إلى ١٥ حزيران ٢٠٢٣. تم استخدام عينة ملائمة (غير احتمالية) لتحقيق أهداف الدراسة، وتم تقييم الالتزام بإعادة تعبئة والادخال الذاتي للأدوية باستخدام مقياس الالتزام واعادة التعبئة للأدوية.

النتائج: لقد اظهرت نتائج الدراسة بان غالبية المشاركين في الدراسة هم من النساء المتزوجات التي تتراوح اعمارهن بين (٥٠ سنة) فما فوق ومستواهم التعليمي خريجو الدراسة الابتدائية وايضا أظهرت النتائج عدم التزام المرضى بإعادة تعبئة الدواء بمتوسط أعلى من نقطة الفصل (١٦) لجميع العناصر وهو إجمالي متوسط الدرجات (٢٧.٩٣).

الاستنتاجات: استنتجت الدراسة أن أكثر من نصف العينة لم يلتزموا بإعادة تعبئة الدواء الخاص بمرضى السكري النوع الثاني حيث الالتزام بالعلاج له تاثير مباشربأتجاة واحد على مرضى السكري النوع الثاني.

التوصيات: يوصي الباحثون بتشجيع وحدات الإرشاد الطبي على عقد ورش عمل تثقيفية وندوات للمرضى حول أدوية السكري وأهمية الالتزام بها حسب جدول يومي.

الكلمات المفتاحية: تطبيق مقياس, الالتزام بإعادة تعبئة الأدوية, السكري من النوع الثاني.

Introduction

Diabetes mellitus (DM) refers to a group of metabolic diseases marked by elevated blood glucose levels [1]. The spread of diabetes has enormously detrimental impacts on the economy, society, and development, especially in poor countries or populations that lack the drive to implement personal health programs [2]. According to estimates, 8.4% of persons over the age of 18 have diabetes in 2022, and that number is expected to rise to 9.9% by 2025 in Iraq [3].

In order to prevent or delay problems and maintain quality of life, type 2 diabetes must be managed as a chronic, complicated condition requiring multifactorial behavioral and pharmaceutical treatments [4]. This includes controlling blood sugar levels, weight, cardiovascular risk factors, comorbidities, and outcomes. In order to enhance engagement in self-care activities, this demands for the delivery of care to be organized and structured, similar to the chronic care paradigm [5]. Insulin controls hyperglycemia in T1DM and some T2DM patients. This highlighted an insulin administration devices, exercise, and calorie counting [6]. T2DM can often be managed without insulin. Lifestyle and nutritional adjustments and non-insulin medicines like metformin are other treatment possibilities. However, if these treatments fail, an insulin therapy would be recommended [7].

Patients with high medication adherence is important for glycemic control. Less than 50% of people with T2DM take their medications exactly as directed. Forgetting to take medications as prescribed is one of the known obstacles to doing so [8]. Numerous factors, such as treatment costs, drug side effects, difficulties navigating complex treatment plans, low patient health literacy, and a lack of social support, all contribute to non-adherence. Non-adherence is linked to significant health hazards in the treatment of several chronic diseases [9]. Therefore, the current study was conducted to find out the extent to which patients with T2DM are committed to taking their medications within a schedule. Therefore, it aims to evaluate adherence to refills and medication self-administer.

Methods

Study Design and Setting

A descriptive study conducted among patients with type 2 diabetic mellitus in Baghdad Teaching Hospital/Medical City Department, and Imam Ali Hospital/Al-

Rusafa Health Department between October 10th to June 15th, 2023.

Sample and Sampling

The sample consisted of T2DM patients who consented to study participate. A convenient (non-probability) sampling method was used. To show a moderately sized effect, a sample size of 110 patients was estimated (α = 0.05, 5% threshold of significance). Based on Slovin's formula, the sample size was determined. The population was 150 patients, and 110 participants were recruited according to the statistical equation to calculate the sample.

Data Collection and Study Instruments

Data were collected by interviewing patients with T2DM, explaining the study objectives and then assess their medication adherence refill and self-administer via ARMS-12 questionnaire. The use of a questionnaire composed of two parts: Part I: Patient socio-demographic and health status include age, sex, employment status, living arrangement, education level, marital status, and medical condition. Part II: Adherence to Refills and Medications Scale (ARMS-12) to assess the adherence to refills and medication self-administer in patients with type 2 diabetes that consist of (12-items, α =0.802). Patient responses were scored by Likert scale with four values ranged from l = none of the time to 4 = all the time. The level of adherence was assessed to each item at (1-1.75= high adherence), (1.76-2.5= moderate adherence), (2.51-3.25= low adherence), (3.26-4= No-adherence). But, Cut off point of all items (≥16), value ≥16 = non-adherent, value < 16 = adherent.

Ethical Consideration

To participate in the study, written consent was taken from the participants. Participants were also informed that they could withdraw from the study at any time. Permission was taken from the College of Nursing (No.: 39, 1/2/2023. Also, permission was obtained to use the (ARMS-12) scale from the original researcher via e-mail.

Data Analysis

Statistical Package for Social Sciences version 24.0 was used to analyze the data.
The statistical data analysis techniques (frequency, percentage, mean of score, cut off point and stander deviation) were used to analyze and evaluatethe study's findings.

Results

Table 1. Socio-demographic and clinical characteristics of patients with Type 2 Diabetic Mellitus.

Variable	Groups	F	%
Age	20 – 29	5	4.5
	30 – 39	10	9.1
	40 – 49	22	20
	50 – 59	31	28.2
	60 – over	42	38.2
	Mean, *SD*	53.88	13.86
Sex	Male	49	44.5
	Female	61	55.5
Employment Status	Employee	36	32.7
	Unemployed	48	43.7
	Retired	26	23.6
Marital Status	Single	10	9.1
	Married	74	67.3
	Divorced	14	12.7
	Widowed /Divorced	11	10
	Separate	1	0.9
Education level	Primary	51	46.4
	Intermediate	26	23.6

	Preparatory	20	18.2
	Institute/ college	11	10
	Higher education	2	1.8
Arrangement of Living	Lives alone	30	27.3
	Live with spouse /partner	58	52.7
	Live with other	22	20
Other Chronic diseases	No	58	52.7
	Yes	52	47.3

F= Frequency, **%**= Percent.

Table (1) shows that the mean of the sample age was approximately 53,88 years old. Moreover, 55.5 % of the study sample were females. Concerning to Employment Status, males, 43.7% were unemployed, 67.3% were married, 46.4% held primary education, and 52.75 of them were living with spouse. Approximately, 43.7 % of the sample have chronic diseases.

Table 2. The level of medication adherence refill and self-administer of patients with type 2 diabetic Mellitus

List	Items	Responses				Mean
		Never	Sometime	Most of	Usually	
1	How often do you forget to take your DM medication?	32	40	20	18	2.21
2	How often do you decide not to take your DM medication?	39	31	25	15	2.4
3	How often do you forget to get prescriptions for your DM medication?	30	48	19	13	2.13
4	How often do you run out of DM medication?	28	42	28	12	2.21
5	How often do you neglect a dose of your diabetes medication before visiting the doctor?	28	35	28	19	2.34
6	How often do you miss taking your DM medication when you feel better?	18	25	23	44	2.84
7	How often do you miss taking your DM medication when you feel worse?	23	20	23	44	2.8
8	How often do you miss taking your DM medication? when you are careless?	31	41	24	14	2.19
9	How often do you adjust the dosage of your diabetes medication?	35	41	31	3	2.01
10	How often do you forget to take your DM medication when you are supposed to take it	27	47	29	7	2.14
11	How often do you put off refilling your DM medication because they cost too much money?	33	31	35	11	2.21
12	How often do you plan ahead and refill your DM medication before they run out?	22	41	27	20	2.39
Total mean score		27.9 No- adherent				

Cut off point of table (4.2.) for total mean score = (≥16), value ≥16 = non-adherent, value < 16 = adherent. Cut off point for items = 0.75, (1 – 1.75 = H-high adherence), (1.76 – 2.5 = M-moderate adherence), (2.51 – 3.25 = L-low adherence), (3.26 – 4 = N-no- adherence).

Table 2 showed that the study sample were not adherent to medication refill at total mean score of (27.9) higher than 16.

Discussion

The sample comprised predominantly older females. Unemployment and marriage were common, with approximately half of participants living with a spouse. Most participants had a primary education level and reported having chronic illnesses. A previous cross-sectional study recruited 120 patients with an average age of 53.43 years, and there were more males than females [(3)]. Another study conducted by Radzi et al., [(4)] indicated that most patients were within the age (64.5) years old and 53.8% of them were male, (76.9%) were married. (39.5%) were held secondary school graduation, (68.3%) were retired, and (56.0%) had chronic illness. In addition, a quasi-experimental study conducted among patients type 2 diabetes mellitus highlighted a mean age of 60.01 years (SD = 14.22), predominantly male (53.5%), unmarried (65.5%). Educational attainment was primarily at the primary level (88.0%) [(5)]. Zairina et al. conducted a cross-sectional study on 266 type 2 diabetes patients, with 201 (75.2%) being female. Factors affecting adherence included unwanted drug effects, medication regimen changes, and refilling prescriptions. The study found a significant difference between education level and adherence, and an association between barriers and medication use [(10)]. Also, the study by Saleh AM found a strong association between gender, education level, medication usage, disease duration, and diet. Out of 202 participants, 56.9% were female, with a mean age of 52.53 years. The majority were male, with a majority of 56.4% exercising [(11)].

The current study indicated that patients having a low or no adherence to refill medication at mean score was 27.93%, exceeding the cut-off point of 16. This is a contradicted of a cross-sectional study conducted by Al-Ganmi et al. [(12)] found that Australian patients with cardiovascular diseases who could better manage themselves and renew their prescriptions had higher adherence to regimens, demonstrated a significantly substantial correlation between social support and patient medication refills. They also found that patients with chronic disease exhibited low medication adherence and had limited social support. This study also revealed differences in adherence between cardiac ward patients and those in outpatient rehabilitation programs [(12)].

Ratanawongsa N, et al. conducted a cross-sectional analysis of 9377 Northern California Diabetes Study patients and found that 30% had poor cardiometabolic medication refill adherence (13). Another study conducted by Jarujumrus and Taychakhoonavudh found that increasing prescription length from 30 to 90 days improved medication adherence in dyslipidemia and type-2 diabetes patients, indicating that the policy change was successful in the hospital [(14)].

A cross-sectional study done by Maruan et al. [(15)] among type 2 diabetes patients showed that patients were adhered to prescription renewals and medication regimens and there was a highly significant linked between social support and prescription refills [(15)]. A randomized controlled trial conducted by van Bruggen et al., study asserted that 80% of patients had an adherence index of ≥0.8 for oral blood glucose, blood pressure, and cholesterol lowering drugs. The intervention group saw a higher increase in drug prescriptions compared to controls [(16)]. Chen et al. study compared baseline sociodemographic characteristics of 120,075 and 240,150 patients with and without disabilities and indicated no significant difference in the distribution of age, sex, income tercile, or low-income status and Medication adherence in patients with type 2 diabetes after disability onset [(17)].

The finding of Saudi study on patients with chronic conditions revealed that a substantial majority of participants (n=159, 76.44%) adhered to their medication regimen, while a significant minority (n=49, 24.56%) did not [(18)]. A study by Aladhab and Alabbood involved 231 patients, with a mean age of 51.85 ± 13.55 years. 65.4% were taking their medications correctly, with 48.8% not taking due to difficulty remembering dosage times. 40.7% were sedentary [(19)]. A Jordanian study among adults with type 2 diabetes mellitus identified significant barriers to achieving optimal glycemic control and adherence to diabetes management plans [(20)]. These patients revealed a suboptimal blood glucose

control with challenges that they encountered in managing their condition [20]. On the other hands, a descriptive study conducted in Cameroon indicated that younger age, insulin therapy, and alcohol consumption were significantly associated with lower medication adherence rates [21]. Another study by Jafarian-Amirkhizi et al. involved 384 patients, 60% females, with a mean age of 55.82 and 75.3% literacy or primary education [22]. Hemoglobin A1c levels were 8.39, with 33% having levels above 9%. 186 patients received monotherapy for type 2 diabetes, with 57.5% having low medication adherence.

There is a contradiction between the current study comparing to the previous studies that patients with DM have a low level of adherence to refill medications.

Conclusion

The study concluded that patients with T2DM did not adhere to refilling the medication within a schedule, and adherence to medications has a direct, one-way effect on these patients.

Recommendations

The study recommend that the Iraqi Ministry of Health intensify its efforts to implement awareness programs for health care providers for their diabetic patients. Encourage medical guidance units in health centers is needed to provide educational workshops and seminars for patients and their caregivers on the importance of adherence to re-dispensing medication within the specified schedule.

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