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VARIA

Effect of pharmacist's patient education on patient compliance in the southeast of Iran: A quasi-experimental study

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Abstract: *Background:* As an essential part of the treatment chain and also the link between physicians and patients, pharmacists play a major role in optimizing drug administration. Compliance with a therapeutic regimen is necessary for therapeutic success, while non-adherence can lead to disease progression and eventually treatment failure. This study aimed to evaluate the impact of pharmacist's patient education on different parameters of patient compliance.

Results: The results showed the patients receiving the intervention compared to the control group, were significantly more adherence to the correct drug use dose ($p = 0.016$), time of use ($p = 0.018$), treatment duration ($p = 0.001$), and frequency ($p = 0.049$).

Conclusions: This study indicates that detailed patient counseling at pharmacies can positively influence different parameters of patients' adherence.

Keywords: pharmacists; monitoring drug therapy; disease management

BACKGROUND

Medication adherence knowledge plays a crucial role in treatment success. Pharmacists' scientific skills to teach required information about drug administration, interactions, side effects storage is crucial to improve patient adherence and so treatment success [1, 2]. Patient education by pharmacists can decrease drug therapy problems arising from inappropriate drug administration or prescriptions and decrease overall health care costs [3-5]. Over the past 30 years, the scope of medication therapy management, as well as pharmaceutical care, focused on more specialized and patient-centered care through a more effective pharmacist-patient relationship [4]. Pharmacists

also are one of the most important parts of rational drug use based on the World Health Organization (WHO) definition [6] and decreasing its burden [5, 7, 8]. On the other hand, inappropriate administration of antimicrobials may lead to drug resistance and treatment failure that is one of the most challenging problems today [7, 8]. Studies show that one of the main causes of irrational drug use is considering pharmacists only as drug distributors and ignoring their potential role as consultants and educators [9, 10]. In 2003,

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the WHO identified poor patient adherence to achieve all therapeutic goals as a major cause of treatment failure [4]. Although the impact of medication counseling by pharmacists on patient treatment outcome, has not been investigated truly, it has been shown that community pharmacists have a great impact on improving patient adherence especially in patients suffering from chronic diseases as well as improving overall community health [1, 11, 12]. Thus, growing an effective patient-pharmacist relationship is a key factor to optimize medication use and it seems necessary to focus on pharmacists consulting skills and supportive laws [13]. In the present study, considering the undeniable role of pharmacists in patient education and improving their compliance with therapeutic regimen, we evaluated the impact of medication consultation on the appropriate use of medication by patients referring to community pharmacies in Zabol city, southeast of Iran at 2019.

METHODS

Design and participants

This quasi-experimental study was conducted on 56 newly diagnosed patients in one governmental hospital (xxxx) affiliated to XXXX University of Medical Science in the southeast of XXXX from March 10, 2019, to August 30, 2019. Participants were selected using a simple random method and distributed to intervention and control groups. Patients were defined new to therapy if they had no evidence of filling prescriptions with their current medications during the past 6 months. Considering the mean scores for treatment belief for two control (5.04 ± 3.4) and intervention (2.52 ± 2.64) groups in pilot research, the type I error of 0.05, the test power of 0.80 as well as 20% sample loss, the required sample size was estimated as of 23 people in each group.

Intervention

The intervention group received their medications with written instructions on drug packages as well as face-to-face education by pharmacists mainly about dosage, regimen, and length of treatment of each drug in their prescriptions. In the control group received their medications only with routine written instructions on each drug package. Each patient in the control group who had a question that needs further education was excluded from the study.

Instruments

The patient's demographic information was included in data collection forms. Two separate questionnaires designed

based on literature review and pilot tested. Patients or family caregiver received the first questionnaire, before collecting their prescriptions and the second one 14 days after. The first questionnaire consisted of four questions about their risk of non – adherence [14] as well as eight questions about their belief about prescribed medicines [15]. The second one consisted of five questions about the patient's practice (correct dose, time, frequency, and therapeutic course) about each of their prescribed medications. The investigator who reviewed patient medications after 14 days and filled out the second questionnaire did not know whether patients are in sample or control groups. The face and content validity of the questionnaire was determined by collecting the six experts' opinions. The questionnaires were then distributed to 20 people in a pilot form. The final questionnaires were designed after identifying the bugs and fixing them. To assess the reliability of the questionnaire. Belief about prescribed medication score and total performance score was obtained from the sum of scores of the relative questionnaires.

Statistical analysis

Statistical analysis of the present data was carried out using an independent t-test and chi-square test using SPSS software (version 21). P-value < 0.05 was considered as significant.

Ethical consideration

The study protocol was approved by the XXXX University of Medical Sciences Ethics Committee (code: XXXXXX) and patients provided written informed consent before participating in the study.

RESULTS

After considering the exclusion criteria, 56 patients were eligible to enroll in this study, 28 patients in both the intervention and control group. Our participants consisted of 45 (80.4%) male and 11 (19.6%) female 7.1% of whom were uneducated. Their ages ranged between 15 - 75 years with the mean age of 33.46 (14.20) years. The mean scores of the patient's primary risk of non-adherence and belief about prescribed medicines were 5.27 (0.92) and 23.89 (3.08) respectively.

There was no statistically significant difference between intervention and control groups in terms of age ($p = 0.640$), gender ($p = 0.313$), level of education I ($p = 0.968$), belief about prescribed medicines ($p = 0.180$) and risk of non-adherence ($p = 0.679$) (Table 1).

Table 1: Demographic characteristics of sample and control groups

		Control	Sample	P-value
Age		30.03 (18.09)	24.43 (15.75)	0.640
Sex	Male	21 (75%)	24 (85.7%)	0.313
	Female	7 (25%)	4 (14.3)	
Level of education	Uneducated	2 (7.1%)	2 (7.1%)	0.968
	Under high school diploma	9 (32.2%)	7 (25%)	
	High school diploma	13 (46.4%)	14 (50%)	
	College degree	1 (3.6%)	3 (10.7%)	
	Bachelor degree	3 (10.7%)	2 (7.1%)	
Belief about prescribed medicines		24.11 (2.92)	23.68 (3.27)	0.679
Risk of non-adherence		5.11 (0.91)	5.43 (0.92)	0.180

Our results showed that patients receiving face-to-face education were significantly more adherent to the correct dose ($p = 0.016$), exact time ($p=0.018$), frequency of drug administration (0.049), and completing the therapeutic course ($p < 0.001$), compared to the control group (Table 2).

Table 2: Comparison of patient's adherence to correct dose, time, frequency and completing the therapeutic course in control and sample groups

	Control No (%)	Sample No (%)	P-value
Correct dose	16 (57.1%)	25 (89.3%)	0.016
Correct Time	7 (25%)	17 (60.7%)	0.018
Correct frequency	14 (50%)	22 (78.6%)	0.049
Completing therapeutic course	3 (10.7%)	19 (67.9%)	<0.001

Finally, 100 % of the patients in the intervention group and 17.9% of the control group were satisfied with the pharmacist's services ($p < 0.001$) (Table 3).

Table 3: Comparison of participants' satisfaction in control and sample groups.

Satisfaction		Control	Sample	P-value
Agree	No (%)	5 (17.9)	28 (100)	<0.001
No Idea	No (%)	7 (25)	0 (0)	
Disagree	No (%)	16 (57.1)	0 (0)	
Total	No (%)	28 (100)	28 (100)	

DISCUSSION

Pharmacists as an essential part of the treatment chain and also the link between physicians and the patients play major roles in health care systems [16]. Studies have shown that pharmacists can improve patient adherence and the rate of treatment success. Noncompliance can lead to irrational drug use, expansion of drug therapy costs, the prolongation of therapeutic courses, and adverse drug reactions. In this study, we evaluated the impact of patient education by pharmacists in different aspects of patient compliance and concluded its positive impacts. Our study population is divided into two intervention and control groups. The intervention group received medication counseling especially about dose, time, and frequency of drug administration and duration of therapy besides routine written instructions on drug packages that were consistent in both groups. We observed that although sample intervention groups were not significantly different in terms of demographic data, risk of non-adherence, and belief about their prescribed medication but their final behavior about their prescribed medications were completely different. Adherence to the correct dosage, timing, frequency, and therapeutic course was significantly higher in patients receiving drug education by pharmacists. They were also more satisfied with the pharmacist's services. These results were in agreement with the previous results of previous studies [17-21].

They proved positive impacts of patient counseling at the pharmacies on accomplishing therapeutic goals, reducing adverse drug reactions, and administration drug errors in their researches. Our findings showed that a relatively high number of patients who did not receive counseling did not

properly follow their treatment course, which can lead to therapeutic failure and its related complications. Especially, when patients are on antibiotics, non-adherence can lead to drug resistance and finally affect both patients and society. The small sample size was one of our limitations in this study, besides if we could monitor a patient's performance more often, we would be able to provide more accurate results and lower possible bias. One of the strengths of this study was that patients with a history of the same disease were excluded from the study so that their previous experiences

did not affect the final results.

CONCLUSIONS

It can be concluded that detailed patient counseling by pharmacists, can positively influence patients' adherence. In this regard, it seems necessary to focus on communicating and counseling skills of pharmacists and even motivational tools as counseling fees.

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