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A patient-centered approach can improve rational drug use. A cross-sectional study

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A – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

Summary **Background.** The current study aimed to investigate the rational drug use characteristics of physicians and the effect of a patient-centered approach on rational drug use.
Material and methods. This cross-sectional and descriptive study was conducted with 182 assistant doctors from November 2020 to April 2021 in a university hospital. Rational drug use features are evaluated by World Health Organization (WHO) prescribing indicators. The patient-centered approach of physicians was measured by the Patent-Practitioner Orientation Scale (PPOS-14).
Results. The mean number of drugs per prescription in the study was 3.0 ± 1.03. 66.5% of the doctors reported that they prescribed drugs to more than half of their patients. Physicians with high patient-centered approach scores were more likely to "call their patients by their names", "use more from drug guides", "follow their patients' treatment processes", and showed interest in "interest in rational drug use studies", and "rational drug use training". Physicians who prefer ready-to-use prescriptions for common conditions had lower patient-centered approach scores. There was a significant positive correlation between the PPOS-14 total score and the rational drug use score (r = 0.153, p = 0.039), and there was a significant negative correlation between PPSO share and care scores and the average number of drugs per prescription.
Conclusions. Physicians with a patient-centered approach were more willing to use rational drugs, follow rational drug guidelines, and receive training on rational drug use. Bringing the patient-centered approach to physicians may improve rational drug use.
Key words: drug prescriptions, World Health Organization, patient-centered care.

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Background

Rational drug use is the ability of patients to provide the appropriate drug, at the appropriate time and dose, at the lowest cost and easily, according to their clinical findings and individual characteristics. Rational drug use contributes to more effective, safe, and economical treatment. Rational prescribing is essential for achieving an appropriate quality of health care for patients and for optimal use of healthcare resources [1].

Polypharmacy, use of antibiotics without prescriptions, unnecessary parenteral drug use instead of oral drug forms, noncompliance with clinical guidelines, and self-medication are the most common types of irrational drug use. Today, irrational prescribing and drug use are important global health problems [2]. Despite the rational prescribing recommendations by the WHO, studies conducted around the world have shown that irrational medicine use is an important problem [3]. Irrational prescribing causes treatment failure, increased adverse drug events, and a significant increase in healthcare costs. Exposure to more than one drug is the most important factor that increases drug side effects. Irrational use of antibiotics has been associated with drug resistance, treatment failure, increased costs, and ultimately decreased trust in the health system. Another form of irrational drug use is syringe and needle-borne infections, which in most cases are caused by choosing unnecessary injections instead of oral treatment [4, 5].

Patient-centered care is defined as the physician's understanding of patients' values, needs, and wishes, as well as providing health care by involving the patient in their healthcare discussion and decisions. The patient-centered clinical method is based on evaluating patients holistically by understanding the disease and their experience with the disease. Patient-centered care is thought to have many benefits and has been suggested as a way to achieve better health outcomes, greater patient satisfaction, and lower healthcare costs [6]. Previous studies reported that patient-centered care is associated with better patient outcomes and satisfaction in medical conditions such as primary care, fibromyalgia, cancer, diabetes, and elderly patient care [7–9]. Bechel et al., in their study on 20 different patients, showed that as a patient-centered approach increased, unexpected deaths and complications decreased [10]. A patient-centered approach also includes understanding patients' beliefs about how they use their medication, possible side effects, and expected benefits. In this context, a patient-centered approach may be associated with more rational prescribing.

It is thought that new studies are needed to examine the effects of a patient-centered approach on rational prescribing. The current study aimed to investigate the effect of the patient-centered approach characteristics of assistant doctors on rational prescribing.

Material and methods

Study design and population

The cross-sectional and descriptive study was carried out between November 2020 and April 2021 with assistant doctors working at a tertiary hospital. The population of the study

consisted of all physicians working as assistant physicians in the tertiary hospital and are involved in outpatient care. Without sampling, all physicians in the study population were targeted, and all these physicians were invited to participate in this study; no incentives were offered to participate. Foreign national residents, those not working at the hospital but working in the hospital only for a rotation, assistant physicians working in the basic medical sciences department and not actively involved in patient diagnosis and follow-up were not included in the study. Between the dates of the study, a total of 240 residents who met the study criteria constituted the population of the study. All residents were invited to participate in the study. The sample of the study consisted of 182 residents (response rate: 75.8%) who agreed to participate in the study voluntarily. The study was approved by the non-interventional research ethics committee (date: 15.10.2020 no: 2020/14-05). Written consent was obtained from all participants in the study.

Variables

Dependent variable

We measured the patient-centered orientation characteristics of the participants with the Patient-Practicing Orientation Scale (PPOS-14), which consists of 14 questions. The PPOS-14 has satisfactory metric values in assessing physicians' patient-centered orientation (Cronbach Alpha value 0.80). The scale has two sub-dimensions: Sharing (Cronbach Alpha value: 0.732) and Care (Cronbach Alpha value: 0.653). Participants answered each question in the PPOS-14 scale on a 6-point Likert style (strongly agree = 1, agree = 2, slightly agree = 3, slightly disagree = 4, disagree = 5, and strongly disagree = 6). Items 7 and 11 of the scale were reverse scored. Participants could obtain a minimum of 14 points and a maximum of 84 points from the scale. A high score from the scale reflects the patient-centered orientation [11].

The knowledge, attitudes and behaviors of the participants about rational drug use (RDU) were evaluated with a 24-questions prepared in accordance with the guideline of the Ministry of Health of the Republic of Turkey, "The study of evaluating the knowledge and behavior of physicians working in hospitals in Turkey regarding RDU" [12]. Physicians; i) to determine their professional experience and department, ii) to question the training on in-service training and rational drug use, iii) to question physicians' ability to use information resources while prescribing, iv) to question the drugs most frequently used by physicians, v) to question the prescribing characteristics of physicians, vi) questioning patients' feedback to physicians, vii) included a total of 19 questions questioning physicians' adverse reaction reporting behaviors and asking physicians' own opinions on RDU were applied with a survey form. Three questions prepared on a 5-point Likert style and 2 questions prepared on a 4-point Likert style were used to evaluate the physicians' RDU attitudes. The questions and scoring used to evaluate the RDU attitude are given below. Q1: Do you prescribe medication based on your patients' complaints without examining them? (1 – always, 2 – usually, 3 – sometimes, 4 – rarely, 5 – never). Q2: Do you prescribe medications requested by patients? (1 – always, 2 – usually, 3 – sometimes, 4 – rarely, 5 – never). Q3: Can you have your patients repeat how to use the drugs you have prescribed? (5 – always, 4 – usually, 3 – sometimes, 2 – rarely, 1 – never). Q4: Do you inform the patient about the drugs you have prescribed? (1 – rarely, 2 – sometimes, 3 – often, 4 – always). Q5: Do you monitor the treatment process of your patients with the drugs you prescribe? (4 – yes, 3 – often, 2 – some drugs, 1 – no). Participants could obtain a minimum of 5 points and a maximum of 23 points from these questions. A higher score obtained from the questions concerning RDU attitude was accepted as exhibiting a more RDU positive attitude.

Independent variables

Age, gender, marital status, duration of practice, duration of residency, and branch of the participants formed the independent data of the study. The participants answered the time spent as a physician and assistant physician as the years spent in medicine and assistantship.

Data collection

The study data was obtained by completing the questionnaires by the participants after they were informed about the study in a special room. A researcher was there to answer questions from the participants. After checking whether the questionnaires were filled out completely or not, the data was appropriately preserved until the end of the study.

Statistical analysis

The study data was analyzed with the IBM SPSS 22 package program. Analysis of continuous data was analyzed with the Shapiro-Wilk test. Descriptive statistics are given as frequency and percentage for categorical data and as median (min-max) for continuous variables that do not show normal distribution. The Mann-Whitney U test was used to compare two independent groups in continuous data that did not show normal distribution, and the Kruskal-Wallis test was used to compare more than two groups. The Dunn-Bonferroni test was used for post-hoc analysis. Spearman's correlation test was used in the correlation analysis between continuous data. A value of $p < 0.05$ was considered statistically significant.

Results

The mean age of 182 residents included in the study was 30.2 ± 3.8 years. 53.3% (n = 97) of the participants were male, and 59.9% (n = 109) were married. 69.2% (n = 126) of the participants were working in the medical sciences division, and 30.8% (n = 56) were working in the surgical sciences division. The demographic characteristics of the participants are presented in Supp. Material 1 and 2.

The characteristics of the participants regarding their daily practice of medicine and RDU attitude are presented in Table 1. The mean number of drugs per prescription in the study was 3.0 ± 1.03. 52.7% of the participants (n = 96) reported that after examining and diagnosing the patient, they took an average of 5 minutes or less to organize their treatment. 44.5% (n = 81) of the participants reported that they wrote prescriptions to approximately 51–75% of the patients who applied daily. 55.5% (n = 101) of the participants stated that they addressed their patients by their names, and 58.8% (n = 107) stated that they frequently informed the patient about the drugs prescribed (Table 1).

The median value of the Patient-Practicing Orientation Scale (PPOS) total score was 48.0 (29.0–68.0), the median of the sharing sub-dimension score was 21.0 (8.0–34.0), and the median of the care sub-dimension score was 28.0 (17.0–35). The median total score of the participants with more than 5 years of practice as a physician was higher than those who started a new practice (p = 0.002). The median scores of the sharing sub-dimensions of the PPOS were higher for internal medicine physicians (p = 0.035), residents for more than two years (p = 0.025), and those with more than 5 years of medical experience (p = 0.001) (Table 2) (Supp. Material 3).

Physicians who addressed their patients by their names had higher PPOS total (p = 0.020) and sharing sub-dimension scores (p = 0.036). The total score (p = 0.010) and subgroup scores (p = 0.012 and p = 0.018) of the participants who declared that they prefer ready-to-use prescriptions for common conditions were lower than those who did not prefer ready-to-use prescriptions. It was determined that those who benefited from the guidelines while prescribing drugs (p = 0.004), who declared that they followed the treatment process of the patients ($p < 0.001$), who followed the studies related to RDU (p = 0.029), and who declared that they wanted to receive training on RDU (p = 0.019) were more patient-oriented (Table 3).

Table 1. Patient examination and RDU attitude characteristics of the participants		
Responses to patient examination	***n***	***%***
Average number of patients cared for daily		
30 or less patients	69	37.9
31 or more patients	113	62.1
Mean time allotted to arrange treatment after examination and diagnosis of the patient		
under 5 minutes	96	52.7
6–10 minutes	63	34.6
11–15 minutes	14	7.7
15 minutes or more	9	4.9
About what percentage of patients presenting daily do you prescribe drugs?		
25% and below	21	11.5
26–50%	40	22.0
51–75%	81	44.5
76–100%	40	22.0
Addressing your patients by their names		
always	29	15.9
generally	101	55.5
sometimes	30	16.5
rarely	17	9.3
never	5	2.7
Status of prescribing medication according to the complaints of the patients without examination		
always	6	3.3
generally	4	2.2
sometimes	31	17.0
rarely	88	48.4
never	53	29.1
Status of prescribing medicines requested by patients		
always	4	2.2
generally	32	17.6
sometimes	65	35.7
rarely	66	36.3
never	15	8.2
Status of informing the patient about prescription drugs		
rarely	1	0.5
sometimes	15	8.2
often	107	58.8
always	59	32.4
Status of monitoring the treatment processes of the patients with the prescribed medicines		
yes, i follow all patients	15	8.2
often, especially if there is additional disease	66	36.3
only drugs that require special attention	75	41.2
no, i don't have a private tracking app	26	14.3

RDU – rational drug use.

Table 2. Comparison of some characteristics of the participants and their PPOS scores						
Features	**PPOS total score**	***p***	**Sharing sub-dimension**	***p***	**Caring sub-dimension**	***p***
Gender						
female	48.0 (33.0–62.0)	0.682	21.0 (9.0–31.0)	0.450	28.0 (17.0–33.0)	0.360
male	50.0 (29.0–68.0)		21.0 (8.0–34.0)		27.0 (19.0–35.0)	
Department						
internal medical sciences	50.0 (29.0–68.0)	0.116	21.0 (8.0–34.0)	**0.035**	28.0 (17.0–35.0)	0.892
surgical medical sciences	47.0 (33.0–64.0)		19.0 (9.0–32.0)		27.0 (20.0–33.0)	
Assistantship period						
less than 2 years	48.0 (33.0–55.0)	0.112	18.0 (10.0–29.0)	**0.025**	27.0 (20.0–33.0)	0.720
2 years and over	49.0 (29.0–68.0)		21.0 (8.0–34.0)		28.0 (17.0–35.0)	
Physician period						
less than 5 years	47.0 (29.0–62.0)	**0.002**	20.0 (8.0–32.0)	**0.001**	27.0 (19.0–33.0)	0.074
5 years and over	51.0 (37.0–68.0)		21.0 (12.0–34.0)		28.0 (17.0–35.0)	
Number of patients per day						
30 or less	48.0 (32.0–61.0)	0.256	20.0 (9.0–31.0)	0.184	27.0 (19.0–33.0)	0.492
31 or more	49.0 (29.0–68.0)		21.0 (8.0–34.0)		28.0 (17.0–35.0)	
Working in past years						
no	50.5 (37.0–62.0)	0.545	23.5 (15.0–32.0)	0.136	26.0 (20.0–31.0)	0.262
yes	48.0 (29.0–68.0)		21.0 (8.0–34.0)		28.0 (17.0–35.0)	

PPSO – Patient-Practicing Orientation Scale.

Table 3. Comparison of participants' RDU characteristics with their PPSO score

Features	PPSO total score	*p*	Sharing sub-dimension score	*p*	Caring sub-dimensional score	*p*
Addressing your patients by their names						
generally	48.0 (29.0–67.0)	**0.020**	20.0 (8.0–33.0)	**0.036**	27.0 (17.0–35.0)	0.238
sometimes	52.5 (38.0–60.0)		24.0 (15.0–31.0)		29.0 (20.0–32.0)	
rarely	46.5 (33.0–68.0)		21.0 (10.0–34.0)		29.5 (20.0–34.0)	
Status of prescribing medication according to the complaints of patients without examining them						
generally	46.0 (29.0–55.0)	0.170	19.0 (8.0–26.0)	0.605	25.0 (19.0–29.0)	0.099
sometimes	47.0 (37.0–68.0)		21.0 (13.0–34.0)		28.0 (21.0–35.0)	
rarely	50.0 (33.0–64.0)		21.0 (9.0–32.0)		28.0 (17.0–33.0)	
Prescribing medications requested by patients						
generally	46.5 (29.0–68.0)	0.412	20.0 (8.0–34.0)	0.768	27.0 (19.0–35.0)	0.802
sometimes	49.0 (33.0–64.0)		21.0 (10.0–32.0)		28.0 (19.0–33.0)	
rarely	50.0 (33.0–67.0)		21.0 (9.0–33.0)		28.0 (17.0–34.0)	
Informing the patient about the prescribed drugs						
rarely	53.0 (50.0–58.0)	0.193	22.0 (18.0–24.0)	0.198	31.0 (26.0–33.0)	0.442
sometimes	46.0 (40.0–51.0)		20.0 (13.0–25.0)		28.0 (20.0–33.0)	
often	49.0 (29.0–68.0)		21.0 (8.0–34.0)		28.0 (17.0–35.0)	
State of creating ready-to-use prescriptions for common diseases						
no	50.0 (33.0–68.0)	**0.010**	21.0 (9.0–34.0)	**0.012**	28.0 (19.0–35.0)	**0.018**
yes	47.0 (29.0–64.0)		20.0 (8.0–32.0)		27.0 (17.0–33.0)	
Rational drug use training status						
have not	48.5 (33.0–67.0)	0.937	21.0 (9.0–33.0)	0.479	28.0 (21.0–35.0)	0.499
have	48.0 (29.0–68.0)		21.0 (8.0–34.0)		28.0 (17.0–34.0)	
Utilization of various sources while prescribing medication						
no	43.0 (33.0–60.0)	**0.004**	18.0 (13.0–30.0)	0.058	25.0 (20.0–30.0)	**0.001**
yes	49.0 (29.0–68.0)		21.0 (8.0–34.0)		28.0 (17.0–35.0)	
Can you have your patients repeat how to use the drugs you have prescribed?						
rarely	47.0 (33.0–67.0)	0.412	20.0 (12.0–33.0)	0.229	28.0 (20.0–34.0)	0.661
sometimes	48.0 (33.0–68.0)		21.0 (9.0–34.0)		28.0 (17.0–35.0)	
often	50.0 (29.0–62.0)		21.0 (8.0–32.0)		28.0 (19.0–33.0)	
Do you monitor the treatment process of your patients with the drugs you prescribe?						
yes	46.0 (38.0–60.0)	0.117	19.0 (15.0–30.0)	**< 0.001**	28.0 (21.0–33.0)	0.265
often	49.0 (35.0–68.0)		22.5 (10.0–34.0)		27.0 (17.0–35.0)	
some drugs	49.0 (33.0–67.0)		21.0 (12.0–33.0)		28.0 (20.0–34.0)	
no	46.0 (29.0–64.0)		16.0 (8.0–32.0)		28.5 (18.0–33.0)	
State of being aware of the work on RDU						
no	48.0 (33.0–68.0)	0.907	20.0 (9.0–34.0)	**0.029**	28.0 (20.0–35.0)	**0.004**
yes	49.5 (29.0–64.0)		21.0 (8.0–32.0)		27.0 (17.0–32.0)	
Desire to receive training on RDU						
no	45.5 (29.0–59.0)	**0.019**	21.0 (8.0–32.0)	0.456	26.0 (17.0–31.0)	**0.004**
yes	49.0 (33.0–68.0)		21.0 (9.0–34.0)		28.0 (20.0–35.0)	

RDU – rational drug use, PPSO – Patient-Practicing Orientation Scale.

Table 4. Correlation analysis between the PPSO score and the RDU score

Variables	RDU total score		Average number of drugs per prescription	
	*r**	*p*	*r**	*p*
PPSO total score	**0.153**	**0.039**	-0.071	0.340
PPSO share sub-dimension	0.088	0.239	**-0.859**	**< 0.001**
PPSO care sub-dimension	0.110	0.138	**-0.627**	**< 0.001**

*Spearman's correlation analysis, RDU – rational drug use, PPSO – Patient-Practicing Orientation Scale.

The median score of the participants from the rational drug use questions was 17.00 (12.00–23.00). A significant positive correlation was found between the PPSO total score and the RDU score ($r = 0.153$, $p = 0.039$). There was a positive significant correlation between the average number of drugs per prescription to the PPSO share sub-dimension ($r = 0.859$; $p < 0.001$) and the PPSO care sub-dimension ($r = 0.627$; $p < 0.001$) (Table 4).

Discussion

The current study focuses on the rational prescribing characteristics of physicians and the effect of a patient-centered approach on rational prescribing. In the current study, 66.5% of assistant physicians reported that they prescribed medication to more than half of their patients. Additionally, the median number of drugs per prescription in this study was 3.57. The evaluation of rational prescribing based on the WHO prescribing indices has been performed in several studies previously [13, 14]. Previous studies have shown that the number of medications per prescription increases the risk of polypharmacy and has been related to irrational prescribing [15]. In the current study, the median drugs per prescription was greater than WHO recommendations. Approximately 23% of resident physicians in the current study population reported prescribing medications based on the patient's complaint without examining the patient. Additionally, approximately 56% of the participants were found to usually prescribe medications requested by patients. According to the WHO, insufficient consultation time leads to incomplete patient examination and subsequent irrational therapy. Atif et al. associated the lack of detailed history taking, lack of comprehensive examination, and inadequate therapeutic relationship between the patient and doctor with irrational prescribing [16]. This current study demonstrated irrational drug use practices in assistant physicians.

The main purpose of the current study is to assess the possible relationship between the above-mentioned irrational prescribing and a patient-centered approach. Previous studies have shown that the better the relationship between the doctor and the patient, the more rational and reasonable the doctors' prescribing behavior [17]. In this context, we assumed that the prescribing behavior of physicians with a patient-centered approach is also rational and reasonable. We found that physicians with high patient-centered approach scores were less likely to create ready-to-use prescriptions for common diseases. Writing proper information on the prescriptions, including the strength and dose of the drug, frequency, and duration of use of drugs, is vital for clear instructions to the pharmacists and appropriate management of the patients [18]. Pan et al. reported that irrational prescribing had a direct and robust association with practical prescribing behaviors [17]. An eight-step approach to appropriate prescribing of medications recommends that the patients' issues must be evaluated and clearly defined before prescribing drugs [19]. Ready-to-use prescriptions will lead to inappropriate drug dosage, polypharmacy, and irrational drug use, as it will reduce drug-patient compliance. The current study showed that a patient-centered approach can increase more rational prescribing by reducing ready-to-use prescriptions. Physicians who reported that they followed the treatment process of their patients with the medications they prescribed had higher patient-centered approach scores. Rational use of drugs depends on pursuing the process of prescription, which includes identification of patients' problems, effective and safe therapy, selecting suitable drugs, dosage and duration, writing a good prescription, providing enough information to the patient, and planning to evaluate treatment responses [20]. Smieszek et al. have reported that delayed prescribing can reduce antibiotic consumption [21]. They defined delayed prescription as monitoring the patient's clinical condition and using antibiotics if symptoms worsen or do not improve. In light of current literature information, it can be thought that physicians who take a patient-centered approach, establish better communication with the patient, and monitor the patient's treatment process may exhibit a more rational prescribing attitude. Participants who wanted to receive training on rational drug use and followed developments regarding RDU had higher patient-centered approach scores. Jahan et al. showed that lack of education on rational use led to an increase in irrational prescribing [22]. In another study, participants declared that doctors need serious training on rational antibiotic use [23]. The current study is insufficient to explain the relationship between a patient-centered approach and physicians' ability to follow current guidelines. A previous study has shown that continuing education and professional experience have an impact on physicians' approach to patients [24]. New studies are needed to investigate the relationship between physicians' patient-centered approach and their willingness to follow current treatment approaches and receive training.

The current study found a positive significant correlation between the patient-centered approach score and the rational drug use score. Additionally, we found a significant negative correlation between PPOS care and share subgroup scores and the average number of drugs per prescription. The current finding shows that physicians with a patient-centered approach prescribe drugs more rationally. Patient-centered care has previously been shown to deliver better health care. Patient-centered care is thought to have many benefits and has been proposed as a way to achieve better health outcomes, greater patient satisfaction, and lower healthcare costs. This approach reduces the risk of treatment failure and ensures optimal use of resources [18, 25]. In this context, the hypothesis that physicians with a patient-centered approach prescribe more rational medications is supported by the current findings.

Previous studies have reported that irrational drug use has been observed in primary care [16]. Chao et al. offered suggestions to improve rational drug use, such as changing the doctor-patient relationship and improving the education of healthcare personnel on rational drug use [26]. Current findings have emphasized the importance of the patient-centered approach, which is the basic patient approach model of family physicians, in order to reduce irrational drug use. Our findings support the theory that we can increase rational drug use by improving family physicians' patient-centered approach.

This study has some strengths. We investigated the relationship between a patient-centered approach, which is known to have many benefits, and rational drug use. Studies investigating the relationship between a patient-centered approach and rational drug use are limited, and the current study focused on this issue. The study population was conducted with assistant physicians in different disciplines. This supported that a patient-centered approach could increase rational drug use regardless of discipline. The current findings, which draw attention to a patient-centered clinical method to solve the important problem of irrational drug use, may lead to future studies.

Limitations of the study

The first limitation of the current study is its cross-sectional and single-centered design. Therefore, it may be insufficient to reflect the general population. Although the patient-centered orientation characteristics of resident physicians were evaluated with the PPSO, there was no scale with proven validity and reliability to evaluate rational drug use characteristics. Physicians' patient-centered approach characteristics were measured by taking into account their own statements. This situation may have affected the physicians' patient-centered approach. Measuring the characteristics of a patient-centered approach with different methods, including the perspectives of external observers and patients, may provide more objective results. Residents' specialties may affect their patient-centered approach

and rational drug use. In the current study, physicians were divided into internal and surgical medical sciences. Due to the characteristics of the study population, comparisons between residents' specialties could not be made. We recommend that future studies differentiate according to residents' specialties.

Conclusions

The current study found that patient-centered approach scores have a significant positive correlation with rational prescribing. A high patient-centered approach score was associated with less ready-to-use prescriptions and better patient follow-up and monitoring of the patient's clinical condition. Participants who wanted to receive training on rational drug use and who followed developments regarding RDU had higher patient-centered approach scores. The current findings support that a patient-centered approach can contribute to more rational drug use, as well as increase the quality of health services provided.

Implications

The first noteworthy finding is that physicians do not devote enough time to their patients. As medical experience increased, a patient-centered approach also increased. The patient-centered approach contributed to the patient-physician relationship and physicians to follow more literature data. Physicians with a patient-centered approach inform their patients more, pay attention to rational drug use, and spend more time on patient follow-up.

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