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Adherence behavior assessment of oral antidiabetic medication use: a study of patient decisions in long-term disease management in primary health care centers in Surabaya

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Abstract:

Background: Adherence to medication has an important role in the long-term management of diabetes. The Indonesian Endocrinologist Association found that of the 50% of the entire population who have been diagnosed with diabetes, two-thirds are undergoing therapy and only one-third have been achieving the intended outcomes of the drug therapy. This study aimed to identify patients' adherence behavior and the root causes of non-adherence.

Methods: This study used a non-experimental mixed-methods approach. A total of 40 patients with type 2 diabetes mellitus (T2DM), who were part of the referral program of the National Health Care Security System (BPJS Kesehatan) were recruited by purposive sampling from 17 primary health care centers in Surabaya, Indonesia.

Results: The adherence behavior assessment revealed non-adherence among 80% of the patients. The highest instances of non-adherence based on the percentage scores involved the following: patients forgot to take the medications (38.23%), patients preferred not to take the medications (20.59%) and the drug products were not available for the patient (14.71%). The factors influencing non-adherence included the complex instructions for taking medication, the absence of a reminder, the unwanted side effects of the drug, the feeling of repetition, the feeling that drugs were ineffective and the concern for the drug's effects on the kidney.

Conclusions: The high rates of non-adherence identified in this study encourage pharmacists to implement better medication therapy management for chronic diseases. The patients' understanding of drug therapy indications and regimens is very important in increasing the expectations of achieving effective treatment, awareness and concern for medication safety and treatment compliance.

Introduction

The prevalence of non-communicable diseases (NCDs) has increased throughout the world. Indonesia is one of the countries with high rates of prevalence and mortality caused by NCDs. The results of the Indonesia Basic Health Research included the four types of NCDs: cardiovascular disease, cancer, respiratory disorders and type 2 diabetes mellitus (T2DM) [1]. According to the International Diabetes Federation (IDF), in 2017, Indonesia was included in the top 10 countries with the highest prevalence of diabetes among the 20–79 age group, the 6th in the world with 10.3 million people diagnosed. This figure is expected to increase to 16.7 million by 2045. The results of the IDF survey in 2017 for people older than 65 years of age did not include Indonesia in the top 10; however, Indonesia is expected to occupy the 7th spot with the diagnoses of 5.4 million people [2]. About 50% of diabetics in Indonesia remain undiagnosed; among those who have been diagnosed, only two-thirds have undergone pharmacological or non-pharmacological treatments, and only one-third have been properly controlled [3].

Since January 1, 2014, Indonesia has implemented the National Health Insurance system (JKN) for NCD services centrally, through hospitals or secondary health facilities (FKRTL), as well as health services with a

tiered referral system in accordance with their medical needs [4]. One of the flagship programs implemented to improve the quality of health for JKN participants and to facilitate access to health services for participants with chronic diseases is the Patient Referral Program (PRB). The PRB service is provided to JKN participants suffering from chronic diseases (e.g. diabetes) who are in a controlled/stable condition but still require treatment in the long term at the primary health facilities (FKTP), such as the primary health centers (*puskesmas*). Specialist/sub-specialist doctors assess whether the PRB patients are under stable condition, and in order to achieve this, adherence to long-term therapy is required [5].

Although adherence to medication is an important factor in diabetes management, it is often overlooked. According to Bailey (2011), a significant proportion of type 2 diabetes mellitus (T2DM) patients showed non-adherence, which contributed to less than the desired control. T2DM requires lifestyle changes and pharmacological therapies to reduce blood glucose, reduce cardiovascular risk, and overcome complications; however, at present, less than 50% of patients achieve glycemic targets with HbA_{1c} <7.0% [6].

Adherence to medication classically assesses a patient's mistakes for not following what the doctor said. Cipolle et al. reported that 70% of patients receiving treatment have drug therapy problems that need to be solved [7]. Patient adherence is the last assessment in the treatment of patients. As the patients are given insufficient treatment information, most of them do not understand the empirical and pharmacological aspects of their treatment. In order to successfully follow a series of instructions, patients must first understand them; however, practitioners often use terms that are not clear or not easily understood by patients. Sometimes, patients understand different definitions of terms, and such a difference can lead to misunderstandings, confusion, and non-adherence [7].

Gellad et al. found that there are three factors influencing patient's compliance: health system, provider, and patient factors [8]. This study used the principle of patient-centered adherence because this is a barrier to compliance. The obstructive factors of patient's adherence include patient demographics, such as age, gender, ethnicity, severity of illness, medication experience, and health literacy [8]. In cases of patients with chronic diseases, nearly 50% fail to comply with medical instructions. Many factors encourage non-adherence, including a lack of patient understanding of their presentation and treatment, low patient confidence in the therapeutic benefits specified and the lack of social support [9].

The pharmacy profession can plan toward the ideal individualized pharmaceutical care services, such as medication therapy management (MTM), which are separate from their dispensing task. The emergence of the philosophy and practice of pharmaceutical care worldwide has challenged pharmacists everywhere to change their old ways and embrace a new paradigm that focuses on outcomes of care rather than on products or tasks [7]. This service empowers patients to take an active role in managing their medications. MTM services encompass the assessment and evaluation of a patient's complete medication therapy regimen and are not limited to individual medication products [10].

Despite its importance, no study has explored medication services in the PRB. This must be managed properly by health practitioners who have competence in the field of pharmacy. Many conditions affect the readiness of patients to change their behavior after receiving information from their health practitioners. These create obstacles that hamper patients from making sound decisions related to the appropriate use of medications, which can help control the disease and resolve the non-adherence problem.

Pharmacists are the last link in the chain of prescription information, which may affect the therapeutic target for patients with chronic diseases. Such information should be comprehensive and integrated with the inputs from other health professionals. However, several factors hamper the effective transmission of appropriate information, including the following: patients have many different prescribers, medications are becoming increasingly complex, patients are developing numerous comorbidities, and they are adding many nonprescription medications. As a result, patients become confused, motivating them to change their dosage regimens or stop taking their medications altogether. In practice, the patient's adherence behavior is never evaluated until the practitioner has determined that the medication given does not provide optimal outcomes. This is the logical way to think about medications and should be the basis for building a different approach to achieving medication adherence.

Materials and methods

This study employed a non-experimental, mixed methods (explanatory sequential design) approach in which triangulation was used for collecting and analyzing quantitative and qualitative data. The combined use of quantitative and qualitative approaches provides a more comprehensive understanding of the adherence behavior phenomenon [11]. This research was carried out through two phases, starting with quantitative data collection using a questionnaire followed by structured interviews for a more in-depth understanding of the patients' adherence behavior.

Data collection was conducted using questionnaires in order to identify patient adherence behavior; this was followed up with an assessment. Adherence is defined as the patient's ability and willingness to carry out a therapeutic regimen that has been clinically assessed by practitioners to be appropriate, effective, and able to produce the desired outcomes without any harmful effects based on all available evidence. In this study, we developed a questionnaire to explore the adherence behavior in using medication for a chronic disease (T2DM). The adherence behavior domain was adopted from the Pharmaceutical Care Practice: The Patient Centered Approach to Medication Management Services reference [7]. The adherence behavior domains used as the research variables and the definitions of each variable are presented below and in Table 1.

Table 1: The domains of adherence behavior and their definitions.

No.	Domain (Item of Questionnaire)	Definition
1.	The patient does not understand the instructions (Q. 1–4)	The patient does not understand how to consume or use the medications appropriately
2.	The patient cannot afford the product (Q. 5–8)	The inability of the patient to buy prescription drugs because the price of the drug product is too expensive
3.	The patient prefers not to take the medication (Q. 9–13)	The patient understands the instructions to take medicine, but prefers not to use drug therapy as instructed
4.	The patient forgets to take the medication (Q. 14–17)	The patient does not remember to take sufficient doses of the drug
5.	The drug product is not available for the patient (Q. 18–20)	Drug products are not available to the patient because of insufficient supplies
6.	The patient cannot swallow or self-administer the drug product appropriately (Q. 21)	The patient cannot swallow or self-administer drug therapy as instructed

There are 21 question items of adherence behavior with a yes or no answer. The scoring of adherence behavior is calculated by dividing the total scores with the total items of the answers. A "no" answer is assigned a value of 1 and a "yes" answer is given a value of 0. Mean scores of 1 and <1 are considered adherence and non-adherence, respectively.

Based on the validity test, the developed adherence behavior questionnaire had a calculated r value > r table of each item, and in the reliability test, this questionnaire showed reliable results with a Cronbach's alpha value of 0.968.

The target population in this study included T2DM patients who used oral antidiabetic medications from the local primary health care centers (*puskesmas*) in the east and south districts of Surabaya who met the inclusion criteria. The inclusion criteria were as follows: patients must have used oral antidiabetic medications for at least 3 months and were referred back to a primary health care (GP) from ambulatory chronic care. The exclusion criteria were as follows: Patients who were unable to read and/or write and patients with multi medical conditions

The research sample size was determined based on the Slovin formula [12] given by

$$n = \frac{N}{1 + Ne^2}$$

where n = the minimum number of samples, N = total population (patients referred back to the PHC on oral antidiabetic medications treatment in their district areas) and e = error tolerance limit. The values of e are given below.

$$n = \frac{211}{1 + 211(0.15)^2}$$
$$n = 36.7 \approx 40$$

Patients were recruited from 17 PHCs, which is undergoing treatment within 1 month of data collection until the number of samples was sufficient. The confidentiality of patient data and data collection places in this study was guaranteed by not stating each identity and processing data to conclude on certain phenomena related to adherence behavior.

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Results

A total of 40 patients with T2DM in the referral program of National Health Care Security System (BPJS Kesehatan) were observed in this study. The patients were recruited through a purposive sampling from 17 PHC centers in the east and south regions of Surabaya. Patients' demographic data and the characteristics of all patients' diabetes treatments are shown in Table 2.

Table 2: Patients' demographic data.

Demographic	Characteristics	$\sum$Subjects (proportion)
Gender	Female	32 (80.00%)
	Male	8 (20.00%)
	40–49 years	1 (2.50%)
Age	50–59 years	11 (27.50%)
	60–69 years	16 (40.00%)
	70–79 years	11 (27.50%)
	>80 years	1 (2.50%)
Educational status	Primary School	13 (32.50%)
	Junior High School	11 (27.50)
	Senior High School	16 (40.00%)
Employment status	Employee	6 (15.00%)
	Unemployed	34 (85.00%)
	<5 years	13 (32.50%)
Duration of diabetes	5–9 years	11 (27.50%)
	10–19 years	12 (30.00%)
	20–29 years	3 (7.50%)
	>30 years	1 (2.50%)
	Metformin	7 (17.50%)
	Gliquidone	1 (2.50%)
Antidiabetic medications used	Acarbose	2 (5.00%)
	Glimepiride	2 (5.00%)
	Gliclazide	1 (2.50%)
	Metformin + glimepiride	17 (42.50%)
	Metformin + gliclazide	1 (2.50%)
	Metformin + gliquidone	2 (5.00%)
	Acarbose + glimepiride	2 (5.00%)
	Metformin + glimepiride + acarbose	5 (12.50%)

Based on Figure 1, it appears that most subjects received a mono therapy and a combination of two oral antidiabetic drugs. The drug most often prescribed for mono therapy was metformin.
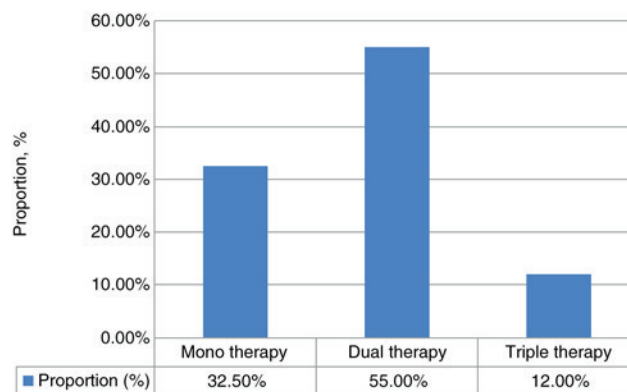

Figure 1: Profiles of oral antidiabetic medications taken by the patients.

Quantitative analysis

Adherence assessment was carried out using the adherence behavior questionnaire developed in this study. The following is a description of the results of the adherence assessment for each respondent (Table 3) and the proportion of adherence behavior of each domain (Table 4).

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The highest non-adherence behavior (score <1) had to do with patients forgetting to take their medication, followed by patients preferring not to take the medication and the non-availability of the drug product.

Table 3: Patients' adherence characteristics in all domains.

Adherence characteristics	∑Subjects, n	Proportion, %
Adherence	8	20.00
Non-adherence	32	80.00

Table 4: Patients' adherence behavior in each domain.

No	Adherence behavior domain	Adherence (mean score =1) ∑Subjects (proportion)	Non-adherence (mean score <1) ∑Subjects (proportion)
1	The patient does not understand the instructions	31 (77.50%)	9 (22.50%)
2	The patient cannot afford the product	35 (87.50%)	5 (12.50%)
3	The patient prefers not to take the medication	26 (65.00%)	14 (35.00%)
4	The patient forgets to take the medication	14 (35.00%)	26 (65.00%)
5	The drug product is not available for the patient	30 (75.00%)	10 (25.00%)
6	The patient cannot swallow or self-administer the drug product appropriately	36 (90.00%)	4 (10.00%)

Qualitative analysis

Direct observations and structured interviews were conducted to identify the factors that cause the patients' non-adherence behavior. Specifically, we assessed what drugs were used by a patient, whether a patient followed the instructions on the label and the suitability of all drugs received and used by the patient (Table 5).

Table 5: Themes of patients' non-adherence behavior.

Domain	The non-adherence behavior themes
The patient does not understand the instructions	1. Needs help from other people to read the instruction to use 2. Uses one's own instruction 3. Untimely takes medication
The patient cannot afford the product	1. Cannot access the drug product because it is not available at the health center and nearest pharmacy 2. Save on medication use
The patient prefers not to take the medication	1. Reduce the frequency of taking medication because of worries 2. Prefer herbal remedies 3. Be bored of taking medication
The patient forgets to take the medication	1. Do not understand the complex instructions for taking medication 2. Do not have a reminder 3. Be in a hurry
The drug product is not available for the patient	1. The medicine is not available, so the patient does not use prescription drugs 2. The amount of medicine given is less than it should be 3. Patients have leftover medication due to non-adherence
The patient cannot swallow or self-administer the drug product appropriately	It is difficult to swallow the medicine

Results of the structured interviews

The interview results on the highest non-compliance domains are displayed in quotes below.

The domain of patients forget to take the medication

The theme of the patient forgetting to take the medication showed that the patients' non-adherence may be unintentional.

Theme 1: The complex instructions for taking medication

In this theme, the patients stated that the main reasons for forgetting to take medication was due to the fact that more than one medication was prescribed and different instructions for use were given:

"…yes, I've forgotten. I often confuse the morning medicine with the afternoon medicine and vice versa." (Subject 7)

"Yes, I've forgotten, hehehe…often confused with one another." (Subject 31)

Theme 2: Nobody reminds the patients

This can be considered a lack of support on the part of the patients' relatives who believed that, because the patients were taking medicine for personal use, they need not be warned:

"Yes, if I take medication, I will drink it myself, never be reminded." (Subject 2)

"Nobody reminded. Yes, I do not ask to be reminded." (Subject 27)

Theme 3: The patients' busy schedules

Having a busy schedule was a classic reason for non-adherence. If patients were in a hurry, taking medicine becomes their least priority:

"I forgot… for example, after eating… I forgot not to take my medication before. Sometimes, I tried to remember whether I had taken medication or not. When in doubt, I don't take medication. If there are many activities and a lot of thoughts, sometimes I forget… whether I have taken a small tablet, which must be taken before eating or not (glimepiride)." (Subject 14)

The domain of patients preferring not to take the medication

In this domain, patients showed non-adherence for various reasons.

Theme 1: Reduced frequency of taking medication because of worries

Themes were grouped based on the criteria of reducing the frequency of taking medicine without consulting a doctor. Such a reduction can affect the efficacy of the medications prescribed:

"Sometimes, there are thoughts of fear of the effects on other organs and I reduce the dose a little. Metformin should be taken 3 times, but I take it only 2×, sometimes 1×. If the blood sugar level is good, I'll reduce the amount of the medicine again." (Subject 7)

Theme 2: Patients preference for herbal remedies

In this theme, patients reduced the frequency of prescribed drug use and added alternative herbal medicines because they believed that herbal medicines were safer and more effective when added:

"My condition still doesn't change… yeahh…like there is no effect from the medicine I take…but I still take them. So, I add the consumption of ginger, turmeric, moringa leaves, some said that moringa leaves are great for diabetes, so I consume it. But…yeahh…the medicine from the doctor I use it if I remember hehehe…" (Subject 5)

Theme 3: Patients being bored of taking medication

In this theme, the majority of patients reported that they were "bored" because they had to take medication regularly; thus, the patients often decide on their own to reduce the frequency without consulting a health practitioner:

"Sometimes, I used metformin only in the afternoon (from the 3 times daily instruction) instead of forgetting…but when I see the medicine, I am sick of it, so I just reduce using it. But I never told the doctor because of fear that I would be scolded, hehehe…usually it was. The doctor said… wooo… you become a doctor yourself, why bother coming to me again. Because of the stories from friends, I decided not to tell my doctor that I don't take my medicine as intended. The important thing for him is that every time I see him, my blood sugar level is never above 200." (Subject 12)

The domain of drug products not being available for the patient

The non-availability of the prescribed drugs when dispensed to the patients could be a cause of non-adherence arising from the health care system.

Theme 1: The medicine is not available so the patients do not use the prescribed drugs

If the drug products were not available at the PHC, the patients were reluctant to get them back or to look for other referral pharmacies:

"Sometimes, there is no quidone in the pharmacy (gliquidone), yeahh…I used only metformin from my husband's. I don't care. the important thing is still taking the medicine that is available. Yeahh… but finally I don't want to be referred back to the PHC again. I don't bother to try." (Subject 3)

"Yeahh… the drug named gliquidone is not ready at Puskesmas, it is also not available at the pharmacy. So, sometimes I just used metformin only." (Subject 17)

Theme 2: The amount of medicine given is less than it should be

Sometimes, the amount of medicine given was less than it should be, so the patient must return another day or look for a referral pharmacy. Patients often decide to buy medicines on their own:

"Sometimes, the amount of medicine is lacking but my child buys it at the pharmacy." (Subject 2)

"Yes, I was given gliclazide for just 3 days. For the next, I bought it myself." (Subject 20)

Theme 3: Patients have leftover medication due to non-adherence

Even though the amount of medication received was sometimes less than it should be, some patients still reported having medication leftover from the previous month – a sure sign of non-adherence:

"Sometimes, if you go to Puskesmas, you'll get the medicine the day after. But I still have a lot of medicine left at home" (Subject 12)

"Sometimes, the medicine is only given for 15 days… this is medicine from the hospital and from the Puskesmas (shown). I often do not return to take the medicine, because there are always many medicines at home. I go to the hospital every three months and once a month to Puskesmas, but there are still many leftover medicines. The medicine is always available, so I share it to people who are diabetic. If they ask, I give it." (Subject 5)

Discussion

The majority of patients in this study were of productive age, unemployed, with secondary school educational level, and on oral antidiabetic medications; 80% reported non-adherence with the medication given. The most prevalent non-adherence behavior had to do with patients forgetting to take the medication, followed by other non-adherence behaviors, such as patients preferring not to take the medication and the non-availability of the drug product.

The domain of patients forgetting to take medication frequently reflects what patients want in terms of concerns about the medications or how they must be taken. Common concerns included risks of taking certain medication, confusion over how to take a medication, and lack of support from the patients' relatives to remind them to take medication. These unintentional cases of non-adherence are a passive process whereby patients fail to adhere to prescribing instructions through forgetfulness, carelessness or circumstances beyond their control (e.g. health literacy) [13]. Pharmacist may initiate a review of patients' understanding of their medications and their preferences to identify the patients' drug-related needs.

Non-adherence occurs because patients consider it unnecessary or because of their fears and beliefs related to the side effects of the drugs prescribed to them. Therefore, it is important to provide clear information about the drugs being prescribed to the patients [14]. Furthermore, patients who feel that their concerns are not being attended to by the practitioner often do not take medications as intended.

The domain of patients preferring not to take the medication indicates that it is most frequently caused by metformin dosing interval associated with the lack of effectiveness. This was observed in patients who received a dosage regimen that was not sufficient to produce the desired pharmacological result. A dosage regimen has multiple parts: the drug product, the dose, the dosing interval, and the duration of therapy [13]. Ensuring that the patients are taking an adequate dosage of their medications to produce the desired effects is the responsibility of the practitioners. In fact, drug therapy problems caused by dosage regimens that are too low are the second most frequently encountered problems in pharmaceutical care practice.

The domain of patients preferring not to take the medication represents intentional non-adherence for various reasons. The majority of the patients were worried about using the medication regularly. Patients' concerns vary. Some were worried about unintended effects, their organs being damaged or feeling that the medication prescribed by doctors were not suitable. Despite the negative effects felt by the patients, it was not possible to know for sure whether they came from the kind of medication consumption or from the patients' own perceptions about the medications.

Concerns related to medications are a major cause of non-adherence. Past experiences with medications have a significant impact on a patient's willingness to take them in the future. Such concerns are frequently the reasons cited why they want to see a pharmaceutical care practitioner [7].

When patients choose not to take a medication as intended, they have what they consider to be a good reason for not accepting advice and not complying with their prescription instructions. Practitioners must internalize the fact that patients' perceptions and health care belief systems, which we discovered during the assessment process, are a major driving force that ultimately influences their decision on whether to seek proper care and whether they should follow instructions and professional advice [7]. Information is the key to what, why, when, how and how long patients follow up on their health problems. The use of this information is classified as an individual's ability to understand the meaning of health information [15], [16].

Strategies like motivational interviewing have been used across practice settings, especially by practitioners with the intent to increase patients' adherence to behavior changes. In order to ensure its effectiveness in patient-centered medication management, the practitioner should acknowledge and attend to a patient's medication experience and, in turn, use it to guide or tailor patient education and counseling on medications so to prevent or resolve drug therapy problems [17].

Medication adherence is an important part of improving clinical outcomes for patients with diabetes. Barriers to medication adherence are complex and individualized, reflecting the fact that each patient manages his/her medications in the context of his/her own life [18].

The domain of the non-availability of drug products shows the lack of access to medication. In the Indonesian Standard of Pharmacy Services in Health Centers (2016), pharmacists are responsible for managing pharmaceutical supplies and clinical pharmacy services [19]. To provide patient-centered services, meeting access to medications is the main thing. Delays in dispensing medication for patients can lead to drug-related problems, one of which is patient adherence. In the current study, adherence was poor among users of traditional treatment and those who were dissatisfied with the services. Thus, developing more intensive communication strategies and improving the quality of services could improve the level of patients' adherence [20].

In the time-limited medical appointment, there may not be enough time to fully explore the challenges to adherence. In terms of future directions, the use of technology to support adherence is an important route for exploration. Evidence has been presented to support the notion that the use of telephone/text-based reminders for appointments improve attendance; thus, text-based reminders for adherence to diabetes regimens are also being explored [21].

The preliminary evidence of this study shows that adherence assessment is an essential pharmacist service, which is part of their responsibility to achieve the definite outcomes aligned with the objectives of pharmaceutical care practices. Accurately identifying patient-specific reasons for non-adherence and effectively implementing appropriate adherence support strategies have been reported to improve patients' adherence and resulted in patients expressing less concerns and having a stronger belief in the necessity of their medicines [22]. In addition, adherence to a medication regimen is a test of the practitioner's ability to practice in a patient-centered manner. Patient-centered adherence can be achieved when the practitioner considers a patient's individual needs, his/her rights and responsibilities, and the practitioner's obligation to make decisions for each individual patient in a consistent, systematic and comprehensive manner [7]. The first limitation of this study, however, is that only clinical observations have been carried out; no interventions have been implemented. Further research must carry out the comprehensive management of drug therapy to achieve definite outcomes from the long-term treatment of diabetes.

When a patient's care setting changes, to facilitate continued MTM services, the pharmacist transitions the patient to another pharmacist in the patient's new care setting. In these situations, the initial pharmacist providing MTM services participates cooperatively with the patient's new pharmacist provider to facilitate the coordinated transition, including the transfer of relevant medication and other health-related information. A follow-up MTM visit is scheduled based on the patient's medication-related needs, or the patient is transitioned from one care setting to another. This adherence assessment tool might be used as a follow up instrument of MTM to determine a patient's adherence and re-assess the case as needed.

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Conclusions

The problem of non-adherence in this study encourages pharmacists to actively participate in the patient care process. The patient's understanding of drug therapy indications and regimens is very important in encouraging a patient's expectations of achieving effective treatment. Information about the safety of treatment will reduce the patient's concern in using the medication as intended. Adherence to medication represents a willingness and an action, which will arise from the patient if all these things are met.

The practice of pharmaceutical care not only provides us with the opportunity to improve adherence, but also imposes a responsibility for us to approach it from a different perspective than what has been considered. This approach is very different. In fact, the traditional meaning of adherence does not really "fit' the paradigm of the practice. Therefore, we will refer to this new adherence assessment tool as "patient-centered adherence."

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Appendix

The Adherence Behavior Questionnaire.

No	Adherence behavior	Yes	No
1	I need help from other people every time I read the instructions for use of my medicine		
2	The information written on the label is unclear, I use my own rules		
3	I don't always use my medicine on time		
4	I am not sure how to use my medicine correctly (*)		
5	I don't redeem medicine that are prescribed to be purchased at other pharmacies (if you have never experienced them, no need to answer)		
6	I replace my medicine with another drugs (herbs or alternative therapies)		
7	I save on the use of my medicine so that it is enough to use		
8	I only take my medicine when I feel my blood sugar level is high/rising		
9	When I feel dizzy, weak or unhealthy, I decide not to use my medicine without checking my blood sugar level		
10	I feel that my medicine caused a negative change to me, so I don't use it		
11	I feel my condition does not improve with medication, so I stop it		
12	I am worried that my medicine will affect the kidneys, so I don't use it regularly		
13	I often feel uncomfortable when using my medicine, so I don't use it regularly		
14	I sometimes forget to use my medicine, because I get more than 1 drug with different instructions for use		
15	I sometimes forget to use my medicine, because my activities are crowded		
16	I sometimes forget to use my medicine, because nobody reminds me		

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17	I sometimes forget to use my medicine because I fall asleep
18	Prescription medicine are not available at the Primary Health Center, so I don't use the medicine
19	Sometimes the medicine at the Primary Health Center is lacking, I don't go back to the Primary Health Center to get the rest of my medicine
20	When my medicine is running out, I don't buy my medicine myself at the pharmacy
21	I have difficulty using medicine, because I cannot swallow or use the medicine

(*) If you have a special drug, show how to use it after filling out the questionnaire.

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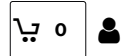# JOURNAL OF BASIC AND CLINICAL PHYSIOLOGY AND PHARMACOLOGY

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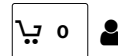
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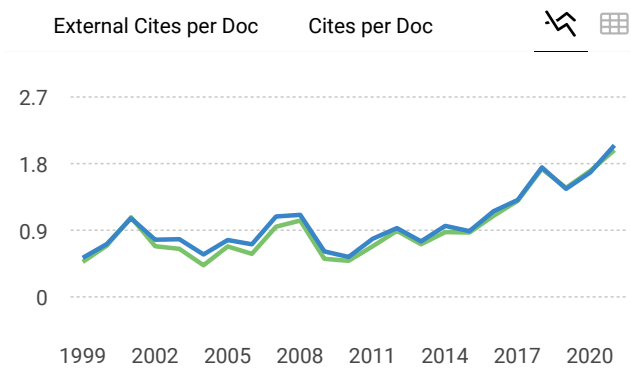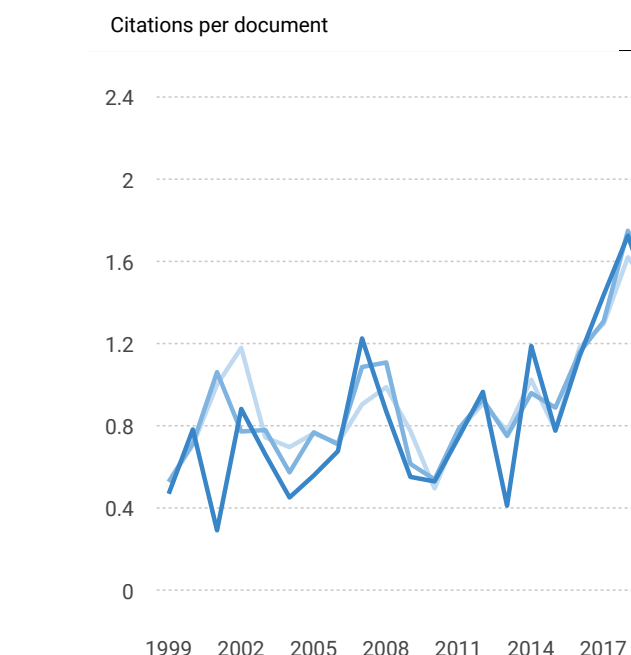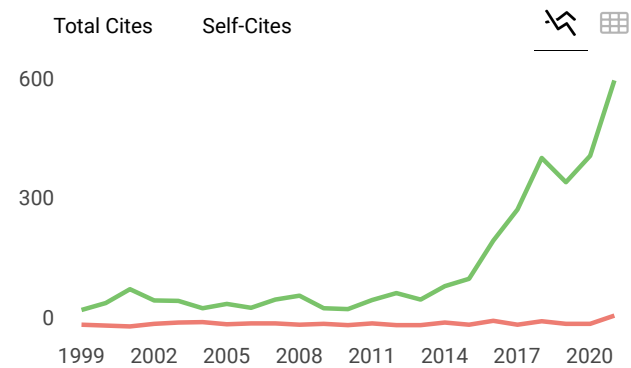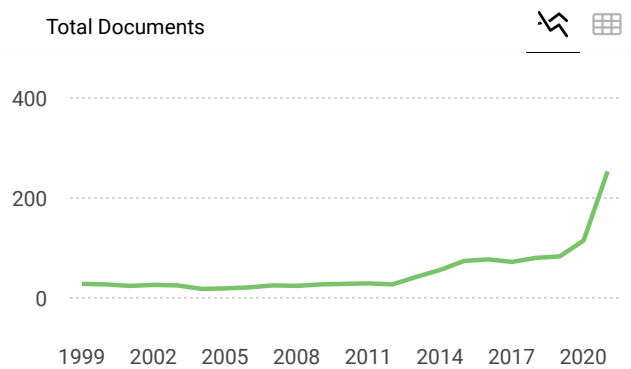◯ Join the conversation about this journal

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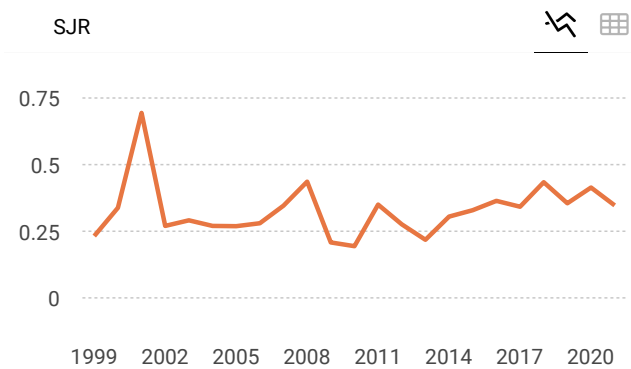
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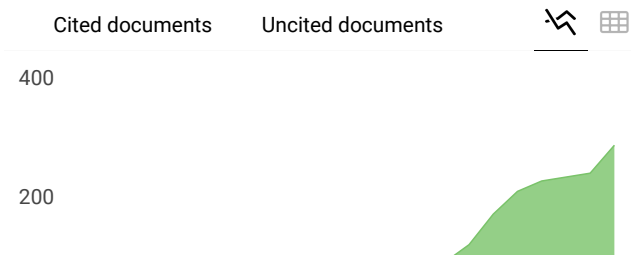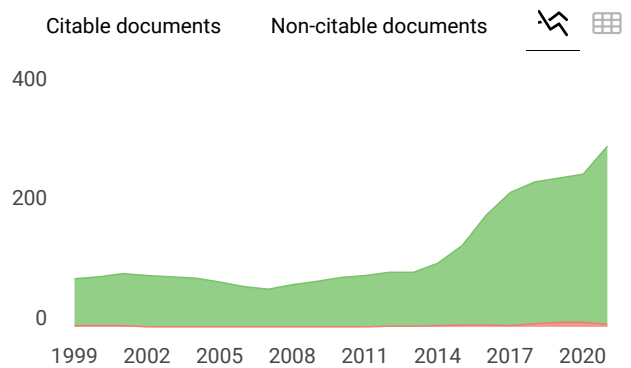
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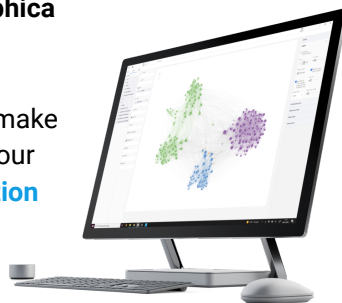
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