



## **Pharmacy Health Coaching Intervention Improve Medication Adherence among Drug Addiction Patients at Sambang Lihum Mental Hospital, Indonesia**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Aims:** To prove the effect of pharmacy health coaching (PHC) on medication adherence among drug addicts at the Sambang Lihum Mental Hospital, South Kalimantan, Indonesia.

**Study Design:** A quasi-experimental one-group pretest-posttest design

**Place and Duration of Study:** Sambang Lihum Mental Hospital, South Kalimantan, Indonesia. Between February to April 2020.

**Methodology:** The pharmacy health coaching intervention was conducted six weeks using a quasi-experimental one-group pretest-posttest design. The study was conducted during February – April 2020. The population referred to the drug addiction outpatients using consecutive sampling

methods that met the inclusion and exclusion criteria. Data were collected by filling out the Adherence to Refills and Medication Scale (ARMS) questionnaire and filling sheets about patient characteristics data and the drug use history of the patients. Data were then analyzed using SPSS 16.0 with the Wilcoxon mean difference test.

**Results:** The results showed that the pharmacy health coaching intervention could improve medication adherence of the patients with drug addiction, where the pre-measurement adherence was only  $16.00 \pm 1.086$ . At the same time, the post-measurement increased to  $18.25 \pm 4.109$  ( $P = 1.00$ ). Based on the study results, it can be concluded that the pharmacy health coaching intervention improved patient adherence, but the increase was not statistically significant ( $P > .05$ ).

**Conclusion:** The pharmacy health coaching intervention improved patient adherence, but the increase statistically was not significant. A large number of samples was needed.

*Keywords: Drug addiction; pharmacy health coaching; medication adherence; adherence to refills and medication scale (ARMS); pharmacy students.*

## 1. INTRODUCTION

The cases of narcotics, psychotropics, and other addictive substances are serious problems faced by the Indonesia Government. The high level of drug abuse can harm the state and profoundly impact Indonesian citizens. In response, the state then declares "DRUGS EMERGENCY." It has some implications for the government and all elements of society, synergistically concerning the causes and impacts of narcotics, psychotropic, and addictive substances in Indonesia [1-3].

In 2012 based on drug cases, South Kalimantan was in the 6th rank with 1,188 cases, and in the previous year, it was in the 9th rank with 887 cases. Here, Banjarmasin City was ranked first out of 12 districts in South Kalimantan based on the recapitulation of drug data from the BNNP South Kalimantan and the South Kalimantan Regional Police 2012 and continued until 2013 [4]. It has brought a worrying impact on Sambang Lihum Mental Hospital as a rehabilitation center in South Kalimantan, Indonesia, especially for drug cases.

Addiction is one of many chronic diseases. Approaches to chronic diseases are highly varied. Recently, a coaching technique has been developed and applied in the health profession, including pharmacy health coaching (PHC) as a patient-centered approach by giving support, education, and feedback to increase awareness and motivation [5]. PHC prioritizes a two-way communication that is adjusted with the uniqueness of each individual [6]. Details about the PHC intervention model can be seen in previous studies [7].

One of the crucial aspects of PHC is managing medication adherence among drug abuse

patients. Adherence here refers to the ability to maintain programs largely determined by health workers related to health promotion or patient instruction [8-11]. Patient adherence for control after hospitalization is deemed necessary concerning the targeted goals [12,13]. However, no research on PHC to improve medication adherence in drug addiction patients was found. Therefore, this study aimed to study PHC intervention's effect on improving medication adherence in outpatients with drug addiction at Sambang Lihum Mental Hospital, Indonesia.

## 2. MATERIALS AND METHODS

### 2.1 Materials

The instrument used in this study was a data collection sheet about patient data, patient characteristics and the patients' drug use history, and the ARMS questionnaire. The materials used in this study included primary data obtained directly during the patient assessment and secondary data obtained from the medical record unit.

### 2.2 Methods

This research used a quasi-experimental one-group pretest-posttest design using primary and secondary data. Preliminary data were obtained during a patient assessment at the pre-intervention and post-intervention. Meanwhile, secondary data were obtained by tracing the patients' medical record data.

This research was conducted from February to April 2020 at the outpatient installation of Sambang Lihum Mental Hospital, South Kalimantan Province, Indonesia. The target population of this study was the outpatients

undergoing drugs addiction rehabilitation at Sambang Lihum Mental Hospital, South Kalimantan. The accessible population referred to outpatients rehabilitation at Sambang Lihum Mental Hospital, South Kalimantan, from February to April 2020. Then, samples were taken from the accessible population that fulfilled the inclusion and exclusion criteria.

Inclusion criteria included: (a) patient with drug rehabilitation which had been examined by a psychiatrist at Sambang Lihum Hospital, South Kalimantan Province, and were assigned to undergo an outpatient treatment; (b) age more than equal to 17 – 59 years; (c) the outpatient with drug addiction who received medication prescriptions by a psychiatrist at Sambang Lihum Mental Hospital, South Kalimantan Province. Meanwhile, the exclusion criteria included: (a) patients living outside a 100 km radius from Sambang Lihum Mental Hospital, South Kalimantan Province; and (b) patients who doctors do not recommend.

The sampling in this study was conducted using the consecutive sampling method with a sampling time of 1 month (during January 2020). For the ethical aspect, the identity of the research subject will be kept confidential. The subject's identity has been written in a particular code set by the researchers to maintain confidentiality.

### 2.3 Preparation Stage

This stage began by proposing, managing the license, and collecting secondary data (including an overview of the Sambang Lihum Mental Hospital, South Kalimantan Province). The number of patient visits, the incidence rate of patients under drug rehabilitation, making protocols on the way to fill out the questionnaire and retrieval forms, and preparing some supporting facilities and infrastructure (writing facilities and others).

### 2.4 Implementation Stage

Data were prospectively collected by taking patients under drug rehabilitation as the research samples. The implementation stage is presented as follows:

1. Taking the data on patients diagnosed from doctors included in the inclusion and exclusion criteria
2. Making the informed consent. The patients were asked to complete the health

assessment sheet and the ARMS questionnaire. The patients agreed to participate in the research and had their data protected.

3. After patient recruitment, pharmacists/ researchers provided weekly PHC services the following week.
  - On the 2<sup>nd</sup> and 3<sup>rd</sup> weeks (1<sup>st</sup> and 2<sup>nd</sup> PHC intervention)
  - On the 4<sup>th</sup> and 5<sup>th</sup> weeks (3<sup>rd</sup> and 4<sup>th</sup> PHC intervention)
  - On the 6<sup>th</sup> and 7<sup>th</sup> weeks (5<sup>th</sup> and 6<sup>th</sup> PHC intervention)
  - On the 8<sup>th</sup> meeting (Final assessment after intervention)

### 2.5 Data Processing

The data expected from the preliminary study were the database of outpatients with drug addiction, including sociodemographic characters. Data were analyzed using the SPSS version 16.0 program. Statistical analysis was carried out in the following methods: Shapiro Wilk test was used to determine the data normality; Wilcoxon test or Paired T-test was used to determine the mean difference of adherence at the beginning and end of the study.

## 3. RESULTS AND DISCUSSION

### 3.1 Characteristics of Patients with Drug Addiction

The research on the increase of medication adherence to outpatients with drug addiction using the PHC intervention was conducted between February and March 2020 at Sambang Lihum Mental Hospital. This research was undertaken prospectively by the outpatients with drug addiction. The sampling was done using the consecutive sampling method where it was done by selecting the samples fulfilling the research criteria, and it was done for one month.

The accessible population was 16 outpatients with drug abuse given the medical treatment at Sambang Lihum Mental Hospital from February to March 2020. The subject participated in the research from the beginning to the end.

From the beginning to the end of the study, eight patients received the PHC intervention whose compliance level was measured using the ARMS questionnaire. Eight patients did not meet the inclusion criteria, including four patients far from their homes – inaccessible for the researcher,

three patients that refused, and one patient dropped out. This study began by collecting the clinical data from patient medical records and patient characteristics data obtained from patient health research sheets. Table 1 presents the characteristics of the research subject data.

Based on the patient's characteristics, this study was dominated by eight male patients. The absence of a female sample was due to the fact that the majority of drug users are male and the sampling time is only 1 month (January 2020), so that in such a short period of time, female patients have not been found. The results of Erikson's research (Santrock, 2002) showed that men and women had different personalities

where the structure of sex determined it. Men were more disruptive and aggressive and had many problems with their social environment. Meanwhile, boys were more ambitious and had a higher aggression level than girls. The samples aged 17-25 years were five patients in terms of age, and 26-35 years were three patients. The education aspect was dominated by three patients with elementary school, two patients with middle school level, two patients with high school level, and one patient with higher institution level. According to research (Wardani & Septianingrum, 2018), adolescents who previously met the criteria determined by researchers were those aged 15-18 years at the risk of drug abuse.

**Table 1. Characteristics of the outpatients with drug addiction**

Patients' Characteristics		Sample	
		( N = 8 )	%
Sex	Male	8	100,00
	Female	0	0,00
Age (in year)	17-25	5	62,50
	26-35	3	37,50
Education	Elementary School	3	37,50
	Middle School	2	25,00
	High School	2	25,00
	Higher Institution	1	12,50
Occupation	Employed	7	87,50
	Unemployed	1	12,50
Type of Drugs	Amphetamine	4	50,00
	Metamphetamine	3	37,50
	Marijuana	1	12,50
	Alcohol	3	37,50
	Carnophen dekstromethorphan	1 2	12,50 25,00
Combination of Drugs	Only 1 Drug	2	25,00
	>1 Drugs	6	75,00
Severity Level	<1 year	1	12,50
	1-2 year	3	37,50
	>2 years	4	50,00
Frequency of Use in a Week	1-2 day	4	50,00
	3-4 days	2	25,00
	5-6 days	0	0,00
	Everyday	2	25,00
Drug Prescription Obtained	Clozapine	6	75,00
	Fluoxetine	5	62,50
	Trifluoperazine	2	25,00
	Trihexyphenidyl	2	25,00
	Lorazepam	1	12,50
	Haloperidol	2	25,00
Rehabilitation Status	Ever	4	50,00
	Never	4	50,00

Adolescents living with their parents and relatives or living in boarding houses or rented houses are likely to be ambitious and have higher levels of aggression. The low level of education can impact an individual's social and emotional condition, which triggers them to get involved in things that harm physical, psychological, social, and spiritual aspects. Drug users tend to be an aggressive experience that causes many problems at school. The efforts of guidance and counseling teachers on the subject come to be difficult due to their effect on education and socialization in the school environment [14].

The occupation was dominated by seven employed patients and one unemployed patient. The drugs were dominated by four patients using amphetamine, three patients using methamphetamine, one patient with marijuana, one patient with carnophen, three patients with alcohol, and 2 with dextromethorphan [15-19]. The combination of drug use was dominated by six patients using more than 1 type of drug and two patients using only 1 type of drug. It contrasts with Nur'artavia's [20] research, stating that most drug users only used 1 type of drug substance.

The severity level was dominated by four patients with used drugs more than two years, three patients with the use from 1-2 years, and one patient with the use less than one year. For the frequency of use in a week, most respondents stated that four patients used the narcotics for 1-2 days per week, two patients used it for 3-4 days, and the other two patients used it every day.

The drug prescriptions obtained were dominated by: six patients with clozapine, five patients with fluoxetine, two patients with trifluoperazine, two patients with trihexyphenidyl, one with lorazepam and two with haloperidol. The most prescribed drug was clozapine, an antipsychotic medication in this study. This drug is given because of the psychotic impact of the drug to decrease brain function, which can lead to reduced memory, difficulty concentrating, delusional feeling, and declining learning abilities [21].

Preliminary data also showed that the number of inpatient rehabilitation patients was proportional to the number (4 patients in each group) who had never experienced inpatient rehabilitation.

### **3.2 Assessment to Medication Adherence**

Patient adherence brings an impact on treatment achievement. The therapy results will not reach

the optimal level without awareness from the patient. Even it can lead to the failure of the therapy. The measurement of non-adherence of the outpatients with drug abuse is vital to determine the treatment effectiveness. The therapeutic target of patients with drug addiction can be achieved appropriately by doing so. However, clinicians often do not ask about the patient's medication habits, probably due to the limited time. One way to assess the medication adherence of patients with drug addiction is by using the questionnaire of the Adherence to Refills and Medication Scale (ARMS) questionnaire.

The ARMS questionnaires were developed by [22]. This questionnaire was used because it has two indicators of compliance measurement: medication adherence and adherence to refill prescriptions. The ARMS questionnaire was not validated by constructs (concepts) as it already exists in the Indonesian version. A construct validation test was carried out with a validity test on 12 questions. The ARMS questionnaire was declared valid with all statements in the questionnaire and can be used as an instrument to measure the medication adherence of patients with drug addiction. Medication adherence was measured at the beginning and end of the study following the PHC intervention.

The category of the results of the adherence level using ARMS questionnaires in this study can be seen in Table 2.

As shown in Table 2, the total score of patient adherence level in pre-intervention and post-intervention was obtained. The patient was declared adherent in medication if the total score equaled 12 and declared not adhere if the total score was more than 12. Several respondents stated they felt they were being monitored every time the researcher made a visit or telephone call. Some felt motivated to improve their health condition so that it created awareness about the importance of taking the medication regularly and the impact when the drug was not regularly used taken.

The pre-intervention data had different data collection techniques in which three patients were given an initial assessment during a visit to Sambang Lihum Mental Hospital (when taking the drug). The initial assessment was carried out in the patients' home for five patients, based on the agreement between the researcher and the patient. Table 3 presents the percentage of the results of the adherence level using the ARMS questionnaire in this study.

**Table 2. Category of the outcome of pre and post-intervention**

No	Name Code	Pretest score	Category	Posttest score	Category
1	R.R.M	18	Not adhere	12	Adhere
2	A.N	18	Not adhere	12	Adhere
3	A.M	19	Not adhere	35	Not adhere
4	H.R	12	Adhere	12	Adhere
5	M.S	12	Adhere	12	Adhere
6	M.H	13	Not adhere	12	Adhere
7	M.D	28	Not adhere	12	Adhere
8	AS	18	Not adhere	39	Not adhere

**Table 3. Percentage of medication adherence level of the patient using ARMS questionnaires**

	ARMS Score			
	Adhere		Not Adhere	
	N	%	N	%
Pre	2	25,00	6	75,00
Post	6	75,00	2	25,00

Table 3 shows a comparison in the results of the medication adherence level in pre and post-intervention. Before the intervention, six patients were indicated as non-adherent (75%) of the total respondents, while only two patients were indicated as adherent (25%). After the PHC intervention, the number of patients adherent with treatment increased to six people (75%), while non-adherent respondents to the treatment decreased into two respondents only (25%). It showed that PHC intervention provided by pharmacists could have a positive impact on the increase of medication adherence levels of patients with drug addiction. In line with previous research [23], PHC intervention provided by pharmacists could improve patients' medication adherence with drug addiction.

The Shapiro Wilk normality test and the Lavene homogeneity test showed that the data were not normally distributed and homogeneous, so a non-parametric test was conducted in the form of the Wilcoxon test. The test results showed a significance value of  $P > .05$ , indicating no significant difference between the ARMS scores in pre-intervention and post-intervention PHC. Table 4 presents the results of the average pre and post ARMS scores.

As shown in Table 4, there was an increase in ARMS scores from the pre-intervention PHC to the post-intervention. The pre-mean value was between  $16.00 \pm 1.086$  and increased by  $18.25 \pm 4.109$  after post-intervention.

The number of non-adherent patients significantly decreased from 6 to 2 patients after post-intervention. The adherent patients

increased from 2 to 6 patients (200%). Still, the non-adherent patient no 3 (35) and no. 8 (39) experienced a drastic increase in their scores, so that both contributed to the rise of the mean score in the post-intervention. The significance test result was 1.000; thus, medication adherence of patients with drug addiction given by PHC had no significant difference. From all SPSS analyses, it can be concluded that PHC intervention can improve outpatient medication adherence with addiction, but the increase was statistically not significant. This finding was in line with the research conducted by Bosmans et al. (2007), stating that the coaching given by pharmacists affected medication adherence. Still, the change that occurred was statistically not significant.

The researchers can explain the "insignificance" in the results above: (1) an inadequate number of samples with only eight patients involved. Consequently, even though the percentage of the increase in patients becoming adhere was 200%, these few samples have made the increase become not significant. (2) In the post-PHC intervention, two patients consciously decided (dropped out) not to redeem the prescribed medicine for the reason of having felt better and long distance from health facilities. It's drastically increased the adherence score and significantly contributed to the overall score, considering few samples (only eight patients). (3) Based on the observations and interviews with patients before receiving PHC intervention by the students of AKFAR ISFI Banjarmasin, the patients received adequate information and counseling about drugs during their routine visits

**Table 4. The score of pre and post ARMS in sample (Mean±SD)**

Treatment Sample	Mean ± SD	P
Pre	16.00 ± 1.086	1.000
Post	18.25 ± 4.109	

to take medication at the hospital. The education and information provided by outpatient pharmacists at Sambang Lihum Mental Hospital included explaining drug terms, indications, directions for use, the importance of medication adherence, storage methods, and other things based on the patient's questions about drugs. It's always done by the pharmacists at the hospital every time a patient redeems the medication. This service has become a part of the excellent service for the pharmacists at Sambang Lihum Mental Hospital based upon the accreditation standards. Hence, though the patients categorically were the "non-compliant" criteria, the ARMS values of the patients (numeric) were not too far from the value 12 (compliant). The average value was 17.25; consequently, the changes that occurred statistically seemed not significant.

#### 4. CONCLUSION

The intervention of PHC clinically increased the medication adherence to the patients with addiction, but this improvement was not statistically significant. A larger sample is needed to see the impacts of the intervention statistically.

#### 5. RESEARCH LIMITATION

This research still has many limitations, including it only involving eight respondents. When the researchers recruited the respondents, only a few outpatients with drug addiction came to Sambang Lihum Mental Hospital. Also, three patients refused to be the research respondents for time limitations and daily activities.

The study was start before the pandemic with a face-to-face concept, so that patients with a distance of more than 100 km would be excluded. We do not immediately apply the telephone method because there is an element of body language communication that is lost during telephone communication. Face-to-face meetings are still preferred to maximize gathering patient modality and increase patients engagement during the follow-up period. Long-distance also became a reason why the researchers did not recruit these patients as respondents (4 people); The COVID-19 pandemic also has brought an impact on the

policies of PSBB (Large-Scale Social Restrictions) and "Stay at Home." Consequently, the intervention that previously was face-to-face then turned into online communication either via Whatsapp application or via direct telephone. This dissimilarity in the intervention method contributed to the research results.

#### CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

#### ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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