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MATHEMATIC MODEL OF PHARMACEUTICAL CARE TO ENCOURAGE CLIENT TO BE RATIONAL IN USE NSAIDs BY SELF MEDICATION

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ABSTRACT

Pharmaceutical care is a practice-oriented pharmacy services to clients, in self medication expected to provide appropriate solutions to the problems faced by clients in order to achieve a therapeutic effect optimal.Now self medication more done by individuals to relieve health problem. There are many actions self medication done in the community , but not many people are aware the rational treatment. Self medication behavior is determined by intention to perform self medication behave determined by attitude, subjective norms and perceived control. The drugs widely used in self medication is a non-steroidal anti-inflammatory drugs. This study wanted to build a mathematics model of pharmaceutical care that may be achieved rational self medication. Research will be conducted on clients who come to the pharmacy by self medication in Surabaya. Research methods are observational, data collection through surveys from 455 pharmacy clients through 89 pharmacies, prospective cross sectional study. The data were analysis by structured equation model. The results showed that pharmaceutical care is to build the attitude, subjective norm and perceived control by estimated value of 0.251; 0.530; and 0.493. behavior in self medication NSAIDs rational is not significantly influenced by client intence the estimated value of -0.03 , but can be formed through pharmaceutical care by pharmacist and client's attitude with estimated value 0.280 and 0,211. The conclusion of this study is pharmaceutical care should be carried out intensively in the service of NSAIDs self-medication by a pharmacist in pharmacy.

Keywords: Self medication, NSAIDs, Structured equation model

INTRODUCTION

Pharmaceutical care is a practice pharmacy services to client, describes the responsibilities of pharmacist in the client's therapeutic process in order to achieve a particular outcome to be able to improve the quality of life [1]. Similarly in self medication, pharmacists expected to provide appropriate solutions to the problems faced by clients in order to achieve an optimal therapeutic effect. Self medication more done by individuals to relieve health complaints. Efforts are made by using drugs on their own without any guidance from medical. Despite the fact that there are many actions self medication done in the community, but not many people are aware the rational treatmentof self medication. Therefore, efforts to build the rational behavior in self medication be essential. The rational self medication is selecting and using appropriate medications correctly include medication, right dose, right duration of treatment , and the right way of life alert side effects [2]. Self medication action describe the behavior in the community formed through the process and interaction between individuals and their environment. Based on theory of planned behavior states that the determinants of behavior is the intention to behave, self medication behavior is determined by intention to perform self medication behave determined by attitude , subjective norm and perceived control to behave. Attitudes are influenced by the outcome of individual self-confidence resulting from a behavior. Subjective norms describe how much influence a reference to shape the behavior and motivate individuals to follow the reference [3]. Perceived control the driving and inhibiting a component outside of the individual to

shape a behavior. Individual often get information, advice or referral of drug from various parties. Resources that affect individual decisions in self medication[4]. Pharmacists are health professionals who serve as important resources in self medication in pharmacy practice. Drugs widely used in the community self medication is a non steroidal anti-inflammatory drugs . Mefenamic acid, diclofenac and piroxicam are include drugs known as anti-inflammatory non-steroidal that may be submitted by the pharmacist directly to the clients. The drug is indicated to treat symptoms of rheumatoid arthritis, osteoarthritis, acute gout, menstrual pain, migraines and headaches. The main side effects are more felt by clients with the use of non- steroidal anti-inflammatory oral are the gastrointestinal tract as nausea, vomiting, diarrhea, stomach bleeding and dyspepsia[5]. In this study wanted to build a mathematical model of pharmaceutical care for drug non-steroidal anti-inflammatory oral, so that can know the factors that influence the achievement of rational behavior in self medication. Research will be conducted on clients who come to the pharmacy did self medication non-steroidal anti - inflammatory oral drugsin Surabaya. Surabaya as the city has a dense and heterogeneous population [6]. This study aimed to obtain an overview of the relationship between variables forming behavior of individuals in self-medication.

MATERIALS AND METHODS

This study is a analytic observational, which was observed directly to the respondent by distributing questionnaires to be analyzed. Based on time studies, including a prospective cross sectional study[7]. Study site is a pharmacy located in Surabaya region that has been selected and the time the study was done to fill in the questionnaire in 2013.

Population and sample: The population is all adult clients who consume drugs non-steroidal anti-inflammatory obtained by self-medication at the pharmacy in Surabaya. The sample is adult consumers who taken on-steroidal anti-inflammatory by self-medication at a pharmacy that has been selected by purposive sampling and met the inclusion criteria. Pharmacy sample determined by cluster random sampling. Un known from previous studies of the area of pharmacy Surabaya is 656, thus the number of pharmacies that are used to obtain a sample of 89 pharmacy were distributed in 10 pharmacies in Surabaya Center, 10 pharmacies in the area of West Surabaya, 11 pharmacies in North Surabaya, Surabaya 32 pharmacies in the South and 35 pharmacies in the area of East Surabaya. From

each selected pharmacy 5 samples taken met the inclusion criteria. The number of samples collected pharmacy clients 455 respondents.

Inclusion Criteria: Inclusion criteria pharmacies are willing to serve as a research site. Ppharmacy clients are people who are visiting the pharmacy, taking non-steroidal anti-inflammatory Self medication , aged 15-60 years who are willing to fill out questionnaires.

Research Variables: Variables in this study consists of latent variables and measured variables. Latent variable is the result of a collection of some size or some indicator that pharmaceutical care, attitude, subjective norm and perceive control, intense and behavior. Measure variables are variables that can be measured or observed so called observable variables. The research instrument was a questionnaire given to the client pharmacies and pharmacists who provide services in pharmacies

Processing and Data Analysis: Data analysis is done by looking for relationships between variables forming behavior of rational use of NSAIDs use Structural Equation Model (SEM) program AMOS version16.1, so as to obtain an overview relations behavioral factors forming drug use non-steroidal anti-inflammatory rational.

RESULTS AND DISCUSSION
Characteristics of Client: From the data collected to analyze the characteristics of the respondents included: age, gender, education and occupation of respondent's client. Age of the respondents were grouped into 6categories, the results showed the highest percentage age distribution of respondents was 21-30 years at 31.3%, This illustrates that the clients who come to the pharmacy and perform self-medication are mostly younger age groups due to the greater activity. Distributions profile of respondents by gender is men 35.7% and women 64.3%. This phenomenon occurs because women are generally responsible for addressing the health of the family, so the response to symptoms of illness in the family is mostly done by women. Education level of the respondent scan be categorized into 4 categories, the results showed the highest percentage education level respondent is high school 62.8% and 7,6 % is elementary school. This type of work is classified as 4 catergories, the results showed that the highest type of work respondents were employees 61%. This phenomenon occurs because the employee health costs not covered by insurance so the first attempt if there are symptoms of pain perceived is to undertake self-medication, more detailed results can be seen in Table1.

Client profiles are Served in self medication NSAIDs: Client's decision to use NSAIDs in self-medication to cure the symptoms was grouped into gout, pain, toothache. Distribution of the symptoms experienced by the client so that the client performs self-medication can be seen in Table2. The highest symptom known by the client so that the client decides to do self-medication NSAIDs was 58% pain, dental pain by 24%, and 9% of gout. Also observed the frequency of visits to the pharmacy, the first time, second and >2 times. 80.5% of clients already known to more than 2 time as visit to the pharmacy. Distribution of client visits to the pharmacy can be seen from Table 2. In this study also observed the client's knowledge of the NSAIDs are used to treat the symptoms of pain, gout or dental pain experienced by the client. There are 3 categories that true understand, wrong understand and do not know. Wrong understand is misconception that the client mentions drugs for causative treatment (antibiotics, reducing agent uric acid) as a pain medication True understand meaning clients mentioned drugs is used to treat the symptoms of pain, gout and tooth-ache.The results showed that only 8.0% of respondents who have a true understanding of NSAIDs, while 55.1% are in the wrong understanding and 36.9% do not know.These results indicate that there are still a few people with really terrible about medications to treat symptoms of pain, toothache and rheumatism. The use of a drug without a true understanding of the drug's potential for Drug related problems. This study also observed the client resources in choosing a drug, the results areas shown in Table2. From table 2 known that NSAIDs information used by clients mainly from friends/family (42.4%). These resources could potentially risk the emergence of one of the self-medication due to family/friends may not unrest and the use of NSAIDs correctly. If the client is connected with the question of recognizing drug used to treat the symptoms, then the choice is the biggest client was familiar with medicine but is actually wrong in choosing and using drugs (55.1%).

Analysis Structured Equation Model (SEM): Data collected 455 questionnaires from pharmacys client, which can be analyzed 319. The data were analyzed through Structured Equation Model (SEM) of each variable of theoretical models have been built using the program AMOS 16.1 stage of tests performed are test of measurement models and then test structural models.

Test of Measurements Model (Confirmatory Factor Analysis/CFA): CFA test performed on each variable. The input matrix is a covariance matrix that is used between the indicators. The first step to test the indicators to ensure there are no assumptions indicators that exceed the limit. The assumption that exceeded the limits can be determined from the value of the goodness of fit or suitability of the model. If the initial of measurement models fit models are qualified then all indicators are part of the contract latent variables.The measurement models olso to see the correspondence between the model with the data (fit model). The results showed confirmatory measurement models in the analysis of each variable is the fit that is an indicator that there is a latent variable constituent or have a good agreement that does not provide any elimination indicator. Furthermore, calculated values of the loading factor indicators forming the latent variables, the results are shown inTable3. Confirmatory measurement models in the analysis of latent variables "pharmaceutical care" shows the model fit means that the indicator variables pharmaceutical care is variable constituent construct pharmaceutical care. The highest factor loading on the indicator "Drug Safety" with a value of0.855, while the lowest factor loading on the indicator "pharmacist interaction with clients" of 0.697, the highest value of factor loading indicates that the indicator construct forming pharmaceutical care is the most important. This means that in performing pharmaceutical care that needs to be emphasized by the pharmacist is the drug's safety, effectiveness and accuracy of the drug in the treatment indication, whereas pharmacist-client interactions in pharma-ceutical care needed but not be forming the most important pharmaceutical care. Model fit was also achieved in the measurement of latent variables attitude. The highest loading factor is the indicator of "Self-medication can treat symptoms" with a value of 0.872 and the lowest loading factor is the indicator of "the potential risk of self-medication" with a value of 0.675. It can be seen that the attitude latent variable is mainly formed by the drug's ability to relieve symptoms of pain, also formed of the benefits of doing their own treatment and expectations of clients get the right treatment. While indicators of risk from NSAIDs self-medication forming attitude smallest pharmacy clients. Confirmatory measure-ment models in the analysis of latent variable "subjective norm" is fit. The highest loading factor is the indicator "Communication pharmacist about the make clients more aware of NSAIDs " with a value of 0.845 and the lowestloading factor is the indicator " Clients understand the rules of use of NSAIDs " to the value of 0.298. From the results can be seen that the variable subjective norm formed mainly by the pharmacist-client personal communication that can provide benefits for self-healing client, the client

feels the need to obtain information about NSAIDs when clients need the drug and the lowest component is the client aware of the risks arising with taking NSAIDs. In the confirmatory analysis of latent variable "intense" resulting model fit, the highest loading factor is the indicator of "Concerned about the safety of drugs used "with a value of 0.775 and the lowest in the indicator "Clients understand the indications of drug use," with a value of 0471.This indicates that the variable "intense" formed mainly by the concerned about the safety of drugs used followed by the effectiveness of NSAIDs, while the understanding of the indications of the drugs used is the smallest component of forming intense that clients choose and use NSAIDs. In the confirmatory analysis on the latent variable "self-medication behavior of clients using NSAIDs" shows the results of the model fit, the highest loading factor on the indicator "Time interval to consuming NSAIDs" with a value of 0.733 and the lowest loading factor in the indicator "The side effects of NSAIDs" of 0.07.This means that the client's self-medication behavior NSAIDs is mainly determined by the client's attention to the time interval of drug use, followed by a long time and how to consume NSAIDs, where a show to save NSAIDs and side effects that may occur is the smallest form of behavior variables client in self-medication NSAIDs

Structural Equation Model and Hypothesis: Test of structural models to ensure the model has been in accordance with the data and make sure there is influence between the variables studied. In structural testing of the model is also used Maximum Likelihood estimation. The first test should be ensured that the model has been fit , If the model has fit the hypothesis testing can be done . Measurements test results on all models of this study variables showed the model fit. Structural models obtained from testing the suitability of the model can be seen in Figure 1. Suitability index value of the model as shown in Table 4. The result shows the criteria for GFI , RMR and CFI provide an index of conformity in accordance with the recommended limits . Test the suitability of the model with GFI, RMR and CFI indices in accordance with the cut-off criterion, who states based on the rules of parsimony if there was one or two models fit the criteria have been met[8], then the model has been declared fit. The suitability of the various indices can be concluded that the proposed structural model fit or have a good agreement.

Analysis of the relationship between latent variables: Analysis of the relationship between the latent variable to variable behavior of self-medication NSAIDs, the results can be seen in Table5. It can be seen that the pharmaceutical care carried out by the pharmacist in serving self-medication NSAIDs affect the client's attitude, subjective norms and perceive control. Client's attitude and subjective norm influence the intention a person in selecting and using NSAIDs, but intention not significant effect on the behavior of the client in self medication. The behavior significantly influenced the presence of pharmaceutical care performed by pharmacy personnel and attitude of the client to NSAIDs. Analysis of the influence of the latent variable to variable self-medication behavior can be seen in Table 6, the behavior of the most affected by latent variables pharmaceutical care with the estimated number of 0.280, while the effect of attitude with the estimated number of 0,211. Subjective norms and perceivecontrol no significant effect on the behavior of self-medication**.** The relationship between latent variables. Effect of each variable to conduct self medication. Furthermore, from Table 5 and Table 6 it can be seen that the pharmaceutical care by pharmacists in the pharmacy enough to affect the client's decision to choose and use NSAIDs (estimated value of 0.280) because the client wants to obtain a safe and effective drug for him. While the decision of the client in selecting and using NSAIDs affected by its attitude toward NSAIDs (estimated value of 0.211), this is because the attitude is influenced by various factors such as the client's knowledge about NSAIDs, previous experience and information obtained from the environment. Intense but not always in line with the behavior of the client in selecting and using NSAIDs

CONCLUSIONS

From the results obtained it can be stated that the pharmaceutical care should always be performed by a pharmacist on any self medication NSAIDs because people are not too concerned of the risks that arise as a result of drug use AIN. The behavior of the client in selecting and using NSAIDs was not significantly influenced by the intense (estimated value of -0.03) but significantly influenced by the presence of pharmaceutical care carried out by the pharmacist (estimated value 0.280) and the person's attitude toward NSAIDs (estimated value of 0,211). Pharmaceutical care to build attitude (the estimated value of 0.251), subjective norms (the estimated value of 0.530) and perceive control (the estimated value of 0.493)

Table 1 Client Demographic Data

Demography	Category	Frequency	Percentage(%)
Age(years)	≤ 20	49	10,9
	21-30	**142**	**31,3**
	31-40	98	21,5
	41-50	73	16,1
	51-60	55	12,0
	> 60	37	8,2
Gender	men	162	35,7
	woman	**293**	**64,3**
Education level	elementary	34	7,6
	Junior high school	47	10,3
	High school	**285**	**62,8**
	college	87	19,2
Type of Work	housewife	90	19,8
	employee	**277**	**61,0**
	civil servants	12	2,6
	entrepreneur	84	18,5

Tabel 2 Client Profiles are Served in self medication NSAIDs

	Category	Frequency	Percentage(%)
Symptom	Gout	43	12,0
	Painful	**264**	**60,3**
	Toothache	115	27,7
The frequency of visits to the pharmacy	First	40	9,0
	Second	46	10,5
	More than two	**354**	**80,5**
Recognizing Drug To Overcome Symptoms	True understand	34	8,0
	Wrong understand	**234**	**55,1**
	Do not know	157	36,9
Source of Information	Doctor	83	19,3
	Pharmacist	89	20,7
	Family / friends	**182**	**42,4**
	Previous experience	75	17,6

Tabel 3 Value Factor Loading

Pharmaceutical care			Estimate
effectiveness of drugs	<---	Pharmaceutical care	.843
Precise indications	<---	Pharmaceutical care	.837
Communication pharmacist with client	<---	Pharmaceutical care	.697
Drug safety	<---	Pharmaceutical care	.855

Attitude			Estimate
The potential risk of self medication	<---	Attitude	.675
Self medication can treat symptoms	<---	Attitude	.872
Clients feel disadvantaged by self medication	<---	Attitude	.826
Self medication showed the results as expected	<---	Attitude	.767

Subjective Norm			Estimate
Communication does not eliminate time client	<---	Subjective Norm	.587

Pharmaceutical care			Estimate
Communication pharmacist make clients more aware about NSAIDs	<---	Subjective Norm	.845
Communication with the pharmacist to benefit clients	<---	Subjective Norm	.782
Clients need to receive information from pharmacists	<---	Subjective Norm	.504
Clients understand the rules of use of NSAIDs	<---	Subjective Norm	.298
Intention			Estimate
Client expectation effective drug used	<---	Intention	.658
Clients understand the indications of drug use	<---	Intention	.471
Concerned about the safety of drugs used	<---	Intention	.775
The behavior of the client in self medication NSAIDs			Estimate
Duration of NSAIDs drugs use	<---	Behavior	.421
Time interval to consuming NSAIDs	<---	Behavior	.733
Time consuming NSAIDs	<---	Behavior	.413
How do NSAIDs save storage	<---	Behavior	.265
The side effects of NSAIDs	<---	Behavior	.007

**Table 4 Suitability Index Models In Structural Behavior of clients inself-medication**

Goodness of Fit Measure	Indeks	*Cut off*	explanation
Chi-square of estimate model	328,831		
Probability Level	0,00	> 0,05	
Goodness of Index (GFI)	0,917	≥ 0,9	Fit model
Adjusted Goodness of Index (AGFI)	0,894	≥ 0,9	Marginal fit model
RMSEA	0,046	≤ 0,08	Fit model
RMR	0,031	≤ 0,05	Fit model

Table 5 The Relationship Between Latent Variables

Variables			Estimate	S.E.	C.R.	P	Label
Attitude	<---	pharmaceutical care	.227	.057	3.998	***	par_17
Subjective Norm	<---	pharmaceutical care	.322	.039	8.238	***	par_18
Perceive Control	<---	pharmaceutical care	.337	.065	5.184	***	par_19
intention	<---	Attitude	.106	.030	3.543	***	par_20
intention	<---	Subjective norm	.405	.062	6.483	***	par_21
intention	<---	Perceive control	.007	.034	.193	.847	par_22
behavior	<---	Intention	-.003	.165	-.018	.986	par_23
behavior	<---	Attitude	.091	.048	1.921	.055	par_24
behavior	<---	pharmaceutical care	.109	.049	2.209	.027	par_25
behavior	<---	Subjective Norm	-.070	.102	-.685	.493	par_26
behavior	<---	Perceive control	.035	.052	.669	.504	par_27

Table 6 Effect of Each Variable to Conduct Self medication

			Estimate
Attitude	<---	Pharmaceutical care	.251
subjective norm	<---	Pharmaceutical care	.530
perceive Control	<---	Pharmaceutical care	.493
intention	<---	Attitude	.254
intention	<---	Subjective Norm	.655
intention	<---	Perceive control	.012
behavior	<---	intention	-.003
behavior	<---	Attitude	.211
behavior	<---	Pharmaceutical care	.280
behavior	<---	Subjective Norm	-.108
behavior	<---	Perceive control	.061
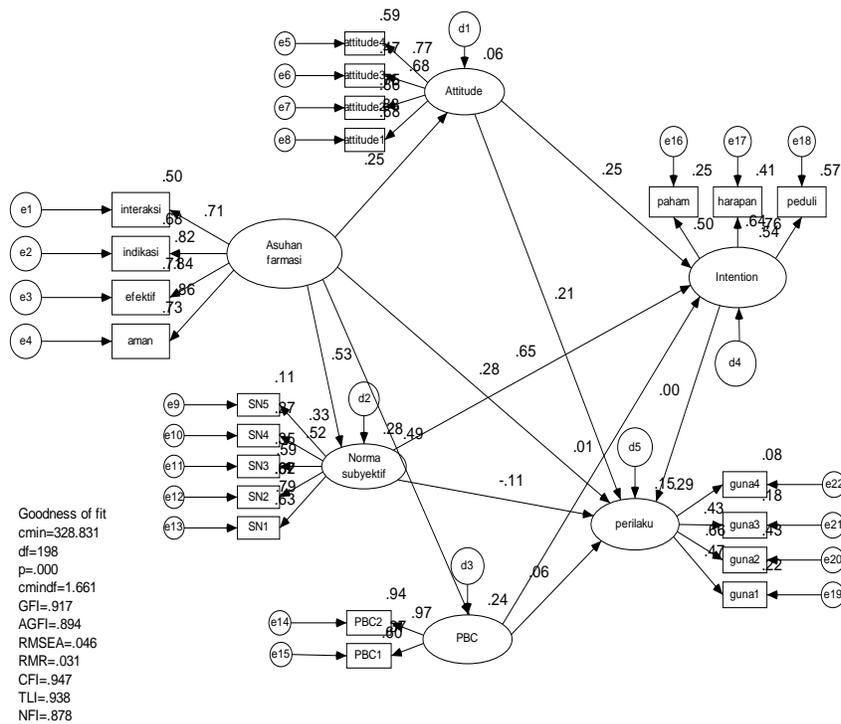
Figure1StructuralModelBehaviorclientsinSelfmedication

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