

Effectiveness of Education Based Information-Motivation-Behavioral Skill (IMB) Model of Improving Knowledge, Motivation, and Performance Demonstration Metered-Dose Inhaler (MDI) to Community Pharmacists in Surabaya

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ABSTRACT

Preparations in the treatment of chronic asthma inhaler is more recommended dosage, but many asthma patients are not able to use an asthma inhaler properly. Dosage forms of inhaler types of metered-dose inhaler (MDI) is the most commonly used ayng. The role of community pharmacists are crucial in educating techniques use an asthma inhaler, but pharmacists can not use its own community and pharmacists current training methods based on knowledge has not been effective. In this study tested the theory-based educational methods IMB compared with conventional educational methods knowledge of the performance of community pharmacists in educating techniques use an asthma inhaler. A total of 25 community pharmacists participate in the research. All 25 pharmacists were then divided into two, the control group (n = 13). In comparison, the use of inhaler technique education based IMB improve the ability of community pharmacists inhaler demonstration is better than knowledge-based education, but there was no difference in the improvement of knowledge and motivation between the two. Although pharmacists who intervned with IMB-based educational models can demonstrate MDI use techniques better than knowledge-based education course.

Keywords: technique using the metered-dose inhaler (MDI), pharmacists, pharmacy, information-motivation-behavioral skills (IMB).

INTRODUCTION

Asthma is a respiratory disorder in the world with an increased prevalence of 50% every decade, and now the number of people with asthma in the world has reached about 300 million patients¹. In 2004, the prevalence of asthma in Indonesia reached 1.1% of the population² and increased to 4% in 2007³. Asthma is a big impact for healthcare quality and patient survival if not well controlled². Worsening asthma cause of outpatient and inpatient⁴, decreased quality of life⁴, which resulted in an increase in costs^{4,5}.

The main options for the treatment of asthma and other respiratory disease is the inhaled through a dosage inhaler more recommended than the oral dosage in the treatment of asthma, for dosage inhalers can distribute the active ingredient directly into the lungs so that the early onset of a rapid and dose required is smaller and more safer than oral preparations^{4,6}. Dosage inhalers require specialized techniques in use and can only be effective when used properly. Errors inhaler use by patients can lead to

deposition of drug that reaches the lungs is not optimal so that decrease the effectiveness of treatment^{5,7}, but many asthma patients can not use an asthma inhaler properly. Inhaler dosage form most widely used is metered-dose inhaler (MDI), which can deliver drugs directly into smaller doses and effective, reduce side effects and with a faster onset bronchodilator⁸. Errors in the use of inhalers be one contributor to poor control of asthma patients⁹. A multicenter survey conducted by the Plaza and Sanchis to 746 patients with asthma in Spain suggests that only 9% of patients were able to use an MDI properly¹⁰. Observational studies conducted Molimard et al.¹¹ mentioned that within one month, 76% of patients using MDI and 49-55% of patients taking asthma patients DPI (dry-powder inhaler) of 3811 in France made a mistake in the use of inhalers. Retrospective study in 3981 patients with asthma in the Britania Raya showed that improper use of MDI lead to poor asthma control¹². Cross-sectional study in Saudi Arabia also found that of 450 patients who were treated in the emergency room due to asthma exacerbations, 203

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(45%) patients were not able to use an asthma inhaler properly¹³.

Educational use of inhaler technique can improve patient skills in using asthma inhaler^{14,15}. Pharmacists are in a strategic position in this case since become one of the first health professionals who encounter patients. Currently pharmacists are also involved in the management of chronic diseases by conducting a review of the treatment of patients, treatment monitoring, and ensure the effectiveness and safety of treatment of patients with the lowest possible cost^{16,17}. Indonesian Ministry of Health (MOH), in the guidelines for asthma pharmacy services also mention the role of pharmacists in asthma management is to detect, prevent, and resolve the issue of treatment of patients, where one of them to educate the use of inhalers¹⁸. The role of community pharmacists (pharmacy) to be crucial to realizing this role for pharmacies to be places where patients buy medicine, either with or without a prescription and community pharmacists are health professionals most accessible to the public¹⁸.

Although community pharmacists have an important role, in fact, there are studies that prove that pharmacists are still limited knowledge in the techniques of using the inhaler correctly. A cross-sectional study in 74 community pharmacists in Saudi Arabia showed approximately 42,25% of pharmacists who can demonstrate how to use the inhaler properly¹⁹. Research in Jordan and Australia said pharmacists difficulty demonstrating the technique of using the inhaler correctly. As a result, patients who are educated make the same mistake as pharmacists²⁰. A survey conducted by Liu et al. illustrate that community pharmacists are also rarely provide education and technical management of asthma inhaler use in asthmatic patients²¹. Pharmacists skills for modeling technique using the inhaler can be increased with education²², but with current methods, increasing their knowledge lasted only briefly, even the same when compared to reading a brochure medication alone²³. Until now, research on the use of an asthma inhaler technique education to pharmacists do also focuses only on the knowledge of pharmacists, but has not touched the willingness of pharmacists to educate. The previous study in Indonesia, about the completeness of pharmacists in explaining how to use the inhaler showing a large part of pharmacists unable to explain how to use inhalers and medical devices completely²⁴⁻²⁶.

Problems in education to pharmacists asthma inhaler dosage lies not only in knowledge, but also the willingness of pharmacists to educate. Needed a breakthrough to resolve this problem. This breakthrough can be realized with the theory of information-motivation-behavioral skills (IMB) model. This theory explains that knowledge is not the only determinants of behavior change, but also by the motivation and skills of individual behavior. This theory has been widely implemented²⁷, but not yet implemented for health workers. Therefore, in this study will be tested IMB theory based education methods compared to conventional educational methods based on knowledge of the performance of community pharmacists in educating technique using an asthma inhaler.

The number of pharmacies in East Java reached 2.380 pharmacy²⁸, and 869 of which are located in Surabaya²⁹. The high interaction pharmacists and patients in pharmacies and pharmacy huge amount, especially in Surabaya making opportunity pharmacists to educate the management of asthma, particularly the technique using the inhaler to the patient is wide open. The purpose of this study was to determine the effect of the IMB-based education compared to conventional knowledge-based education, the difference in terms of knowledge, motivation, and a demonstrated ability to MDI tool.

METHODS

Research design

This study design using randomized controlled trial with intervention in the test group is a method of educating pharmacists theory-based IMB, which contains material increased knowledge, motivation, and behavioral skills of pharmacists, while intervening in the comparison group in the form of a method of education of pharmacists knowledge based containing material increase in the knowledge of pharmacists. Random allocation methods was done through a lottery system. The study was conducted in Surabaya, East Java. The number of pharmacies operating in Surabaya in Surabaya City Health Department in 2013 amounted to 869 pharmacies²⁹.

Research Variable

The independent variables: the method of education given to pharmacists. The dependent variables in the study: (a) knowledge of pharmacists on the preparation inhaler and common problems that occur in the use of the inhaler; (B) the motivation of pharmacists to educate engineering MDI use in patients with asthma; and (c) the demonstration of the technique's ability MDI use by pharmacists as measured through the checklist assessed by interrater.

Populasi dan Sample

The population in this study is the community pharmacists working in a pharmacy in Surabaya. The population were pharmacists working in a pharmacy in the city of Surabaya who stand by at a pharmacy at least 8 hours/day within 5 working days and working in a pharmacy that sells an asthma inhaler, a total of 114 pharmacists. While willing to engage in research and the research samples are 25 pharmacists, which will then be divided into two groups: control-group (pharmacists who receive interventions such as education conventionally, that is just knowledge alone) and the experimental-group (pharmacists who receive interventions such as education knowledge and motivation with the IMB model).

Method Of Collecting Data

Intervention made in the form of educational meetings. Pharmacists in the experimental- and control-groups will be given the training is divided into three parts, namely a session to improve the knowledge, motivation, and behavioral skills of pharmacists. The intervention is done by pharmacists to meet one by one. Intervention time was 2 hours. Preliminary study in the form of short questions given to community pharmacists pharmacists-done first, so that the form of intervention according to the needs of community pharmacists in the field. The question in the

preliminary study include: interest in community pharmacists to learn the techniques of the use of asthma inhalers and why, obstacles faced by community pharmacists educate patients currently use an asthma inhaler technique, and the reason for the reluctance to educate community pharmacists technique using an asthma inhaler. Materials about asthma is divided into two parts: (1) Presentation of the inhaler dosage system and function in the treatment of asthma inhalers, and (2) Description of the asthma inhaler, which is done through presentations and hands-on of MDI.

Intervention

The material of this intervention is only done in the experimental-group. Patterns of thought in motivational intervention based on the data obtained in the preliminary study. Researchers found that the problem occurs is a pharmacist does not understand how to use an asthma inhaler and feel that the patient has to understand how to use an asthma inhaler. This triggers the reluctance of pharmacists to teach how penggunaan asthma inhaler. Motivation pharmacists upgraded by expectancy theory, where pharmacists upgraded valence and ekspektansinya through various examples of cases the impact of asthma patients are not educated properly.

Grouping the data will be divided into three, namely:

Pre-test : the conditions under which pharmacists have not received the intervention, both in the control-group and the experimental-group

Post-test : the conditions under which pharmacists have just finished getting the intervention, both in the control group and the experimental-group

Follow-up test : condition three weeks after pharmacists to intervention, either in the control group and the experimental-group

Pharmacist Behavior Intervention Skills

Behavioral skills to be given is to educate engineering skills use an asthma inhaler. One of the difficulties in the community pharmacist to explain the use of an asthma inhaler technique is the absence of an example of an inhaler to help them explain. Researchers create tools in order to facilitate the pharmacists demonstrate inhaler use techniques to pharmacists. These tools are made in the form of a book that contains images that can be driven MDI (Table 1). This book has sections are moved to imitate the parts in asthma inhalers.

Knowledge, motivation, and performance of pharmacists will be measured before, after, and 3 weeks post-intervention (follow up), and 3 weeks are determined based Ebbinghaus Forgetting Curve suggests that the pace of decline of knowledge a person begins to slope at 3-4 weeks post-administration of education³¹. Measurements were carried out as follows: Knowledge is measured through a questionnaire pharmacists, pharmacists motivation was measured through a questionnaire, and demonstration capabilities inhaler was measured by 3 raters. Rate capability demonstration based on the total score of steps successfully use the inhaler properly described and success or failure of the entire critical pharmacist to explain each step of using an inhaler. New pharmacists expressed successfully demonstrated the use

of the inhaler when the third step rater assess pharmacists have done that step (1 not, then the scores are not counted). In the follow-up measurements, respondents were not told the exact time will be measured. Each candidate will research subjects informed consent as consent to participate in research. Information obtained from the subject will not be distributed other than for research purposes and the identity of the participants only researcher who knows.

Validation of Knowledge Questionnaire

The questionnaire has been validated knowledge and motivation. Step-by-step validation is to do try out a questionnaire to the pharmacist community, then revamping the contents of the questionnaire, based on the results try out, and validated questionnaire that has been modified based on the results of the try out, and KR 20 (questionnaires knowledge) and Cronbach alpha (motivation questionnaire) is then determined. The questionnaire is valid when KR 20 questionnaires and Cronbach alpha equal to or greater than 0,7. Rater reliability testing using the intraclass correlation coefficient (reliable when $\alpha > 0,7$) and kappa agreement (reliable when $\kappa = 0,7$).

Data Analysis

- Kolmogorov Smirnov test: Test to determine if the data follow a normal curve or not. This test determines whether the analysis of parametric or non-parametric use. Data is said to follow a normal curve when $p \geq 0,05$
- pooled t-test: parametric difference test used to compare the control- and experimental-group in terms of: knowledge, motivation, and the total score demonstration of an asthma inhaler. The difference is said to be significant when $P < 0,05$
- paired t-test: parametric difference test used to compare the average parameters during pre, post and follow-up research in terms of: knowledge, motivation, and the total score demonstration of an asthma inhaler. The difference is said to be significant when $P < 0,05$
- Mann Whitney test: Test of non-parametric difference is used to compare the experimental- and control-groups in terms of: knowledge, motivation, and the total score demonstration of an asthma inhaler. The difference is said to be significant when $P < 0,05$
- Wilcoxon signed rank test: Test of non-parametric difference is used to compare the average parameters during pre, post and follow-up research in terms of: knowledge, motivation, and the total score demonstration of an asthma inhaler. The difference is said to be significant when $P < 0,05$
- glass size effect: Used to determine how large the difference between the average. The formula is the effect size (mean A-mean B) / SD A. Interpretation effect size is: 0,2 = small; 0,5 = medium; 0,8 = large
- chi square test: Test different proportions. Used to compare the proportion of community pharmacists who are able to demonstrate critical step³⁰ in correctly, both the control and experimental, maupu comparisons within the group. The difference is said to be significant when $P < 0,05$.

Table 1: Checklist of MDI Devices³⁰.

Steps	Instructions
1 *	Remove the cap
2 *	Shake the inhaler several times
3	Stand and hold head up straight, holding the inhaler in a mouth-piece down position
4	Exhale all the way until you can breathe out no more
5	Place the mouth piece between your teeth and close your lips, don't block the opening with your mouth
6 *	While breathing in deeply and slowly depress the top of the metal canister to release a dose
7	Continue to breathe in slowly over 4-5 second
8	Hold your breath for 10 second
9	Breathe out slowly

*: critical step

Table 2: Validation of Knowledge Questionnaire.

No.	Question	Pearson Correlation Value
		P value
1	Agent of asthma therapy were divided into two groups, namely reliever and controller	0.535
2	Roles controller agent in asthma therapy is to relieve shortness of patients during an asthma attack	0.509
3	Controller agent is only used when necessary during an asthma attack experienced by patients	0.406
4	Metered dose inhaler (MDI) creates aerosols using pressurized air to distribute the active agent	0.401
5	Spacer is a tool that can be used when difficulties asthma patients inhale medication through the dry powder inhaler (DPI)	0.371
6	The use of spacers can reduce the amount of aerosol deposited in the mouth and throat	0.486
7	The effectiveness of inhaled corticosteroids will be increased if the earlier patients use inhaled beta agonists in advance	0.333
8	Method of inhaling asthma inhaler medication is the correct through the nose	0.623
9	When using the dosage metered-dose inhaler (MDI), it must be pressed first before, then the drug can be inhaled	0.313
10	Metered dose inhaler (MDI) should be shaken before use so that levels of drug in aerosol homogeneous	0.350
11	Patients had to wait 1 minute after the first spray inhaler prior to spray into two	0.428
12	The mouthpiece and the cap of metered-dose inhaler (MDI) wiped with a cloth moistened with warm water after use to prevent clogging of the inhaler	0.436
13	Methods to determine whether the contents of metered-dose inhaler (MDI) is up is shaking	0.429
14	Spacer should be cleaned with warm water every week	0.424
15	Aerosols containing ipratropium bromide as active ingredients, can cause glaucoma when exposed to the eyes	0.472

P-values significantly correlated assessed with $p < 0,01$

RESULTS AND DISCUSSION

This study was conducted from January 2014 to January 2015. From the analysis, 71 community pharmacists have been willing to fill out a questionnaire pre-intervention and a total of 29 community pharmacists take part in the study (15 pharmacists for experimental-group and 14 pharmacists for control-group). Total pharmacists who follow the research until the end amounted to 25 pharmacists (13 pharmacists for control-group and 12 pharmacists for experimental-group).

Validity and Reliability of Knowledge and Motivation Questionnaire

The validity of the questionnaire was tested by using internal consistency discrimination index test was used to correlate between items with a total (Pearson

Correlation). Item considered valid if it has a significant correlation with total and knowledge questionnaire, all items are significantly correlated with the total score ($p < 0:01$). Pharmacists involved in the validation of this questionnaire as many as 71 people. The results of the validation test knowledge questionnaire Pearson Correlation, showed all the questions are valid (Table 2). The results of the validation test motivation questionnaire as many as 18 numbers performed by Pearson Correlation test, showing all numbers are valid except for number 13 ($p = 0,113$). Number of pharmacists involved in the validation of motivation questionnaire as many as 69 people. Item No. 13 which reads "I'm not confident with the employee another pharmacy if I do not know how to use an asthma inhaler" is the only item that measured

Table 3: Motivation Questionnaire Validation.

No.	Question	Pearson Correlation Value
		P value
1	I am happy to explain if there are patients ask me how to use an asthma inhaler	0.645
2	My job satisfaction will increase if more and more are asking how to use an asthma inhaler to me	0.544
3	It is the duty for pharmacists to educate patients on how to use an asthma inhaler	0.762
4	I am confident in my ability to demonstrate how to use an asthma inhaler to the patient	0.648
5	I would remind colleagues that are not pharmacists to educate patients on how to use an asthma inhaler	0.441
6	I refuse to explain how to use the inhaler because I believe patients will by themselves	0.745
7	Demonstrate how to use an asthma inhaler to the patient just wasting my time	0.695
8	I'm too busy to have time to educate patients with asthma	0.689
9	I cannot educate asthma patients because the pharmacy do not have the facilities to support	0.523
10	I feel no need to educate because my supervisor thought it was not important	0.737
11	My job is to manage the pharmacy, not to educate patients	0.672
12	Educate patients how to use an asthma inhaler increase the burden of my work	0.813
13	I'm not confident with the employee another pharmacy if I do not know how to use an asthma inhaler	0.113
14	I do not educate asthma patients because of other pharmacists also did not do it	0.782
15	I feel patients with asthma do not require education that I give them	0.750
16	I do not educate patients with asthma because they did not ask for it	0.570
17	Conducting educational way of the use of an asthma inhaler was duty doctors and nurses.	0.597
18	I found a place only pharmacies sell medicine, not more	0.591

P-values significantly correlated assessed with $p < 0,01$

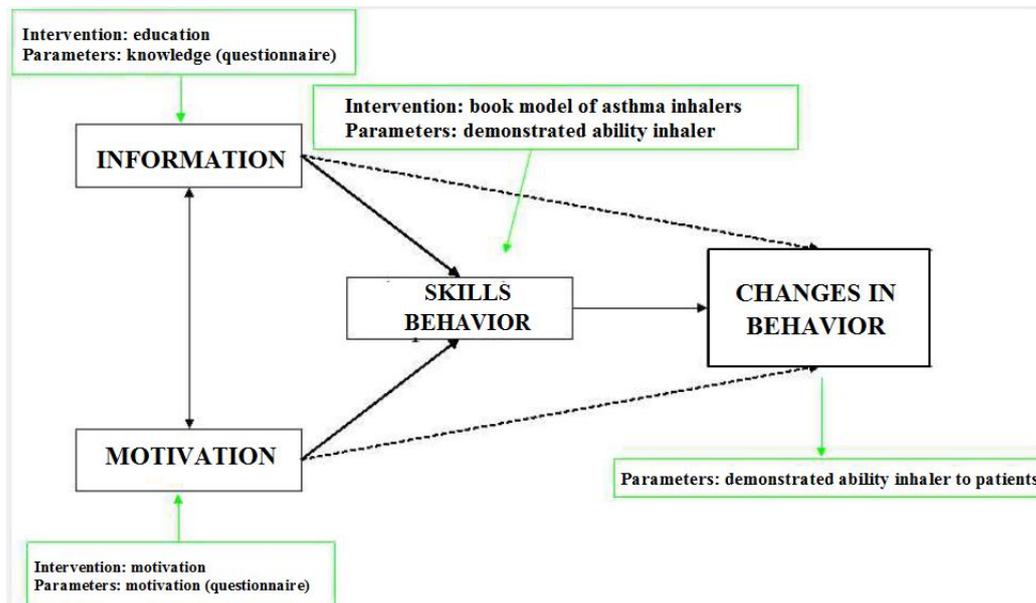


Figure 1: The Research Based IMB Scheme³¹.

motivation pharmacist if it is associated with co-workers, so that the item no 13 also still be included in the analysis (Table 3).

Knowledge questionnaire reliability was determined by Kuder-Richardson Formula 20 (KR20), which measures the reliability of the questionnaire classified by a binary choice answers. Reliability motivation questionnaire determined using Cronbach alpha. KR20 value and the

desired Cronbach alpha equal, i.e. $> 0,7$. Results of the reliability test your knowledge with KR20 is 0,735 and the test results reliabilitas for motivation with Cronbach's alpha was 0,889, so it can be concluded reliability of knowledge and motivation is reliable.

Appraisers Rater Reliability Demonstration Techniques Use of MDI

Third-rater reliability were used in the study was

Table 4: Data Normality Test Research.

	Sig.					
	Pre-test		Post-test		Follow-up-test	
	Control- group (n:13)	Experimental -group (n:12)	Control- group (n:13)	Experimental -group (n:12)	Control- group (n:13)	Experimental -group (n:12)
Knowledge	0.185	0.2	0.021*	0.2	0.2	0.114
Motivation	0.136	0.022*	0.16	0.088	0.09*	0.006*
Total score MDI	0.051	0.200	0.162	0.017*	0.114	0.2

*= not normal

determined by using the intraclass Correlation coefficient. Magnitude reliability displayed in the form of Cronbach alpha, with the desired values $>0,7$. Rater reliability test results are 0.909 (intraclass Correlation coefficient) and 0,767 (Kappa agreement) so that it can be concluded both are reliable.

Characteristics of Study Sample

A total of 24 of the 25 community pharmacists who participated in the intervention pharmacist pharmacy managers with an average age of 34 years in both groups. The data analysis normality Kolmogorov Smirnov. The results $P \geq 0,05$, indicate the data follow a normal curve and parametric inferential analysis can be done. There is some data that is normal, and some will not, as shown in Table 4. There is a series of data that is not normal in every parameter measured, so that inferential analysis used is a non-parametric analysis. Non-parametric analysis used was Mann Whitney test, complemented by glass size effect (Table 4). There is no significant difference between the two groups at baseline as shown in Table 4. Glass effect size for each parameter measurement also showed no difference. None of community pharmacists are able to explain every critical step in the inhaler asthma inhaler correctly at the start of the study.

Pharmacists, as a profession whose role in dispensing the drug has a responsibility to ensure that patients can consume or use prescribed medications properly. This responsibility is no exception to tools that require the use of special techniques such as asthma inhalers¹⁸. Difficulties experienced by community pharmacists allegedly because of limited access to information, or the pharmacist feels that the available information is limited. The main obstacle encountered was the lack of props (35%), but the major barriers encountered in an asthma inhaler is studying pharmacists accessible to pharmacists, such as: lack of information or training obtained (25%), difficulty in learning various variations inhaler (23%), goods rarely sold (6%), had never seen inhaler (6%), the brochure is not clear (4%), and patients said already know how to use (2%).

Motivation pharmacists into the sample prior to intervention can be said to be high, reaching a score of 74,9231 and 72,75 out of a maximum score of 90 in the questionnaire. Community pharmacists are willing to follow the research only a small part of all community pharmacists in Surabaya, so it can be predicted that pharmacists automatically selected study participants and motivated relatively higher than in the population.

Changes Between Community Pharmacists Ability Based Educational Interventions IMB Compared to Conventional Education

IMB models suggested that information, motivation, and behavioral skills are a fundamental part that determines the behavior of a person's health. Individuals who are knowledgeable, motivated, and have the skills required behavior, then the behavior of good health can be maintained. Individuals who do not have the information, motivation and behavioral skills will behave contrary enough²⁷. Research schemes based Information-Motivation-Behavioral Skills Model³¹, can be summarized in Figure 1 below.

Elements of information and motivation are mutually reinforcing and both of these elements can improve behavioral skills, which in this case is the ability to demonstrate the use of an asthma inhaler technique. Based on this theory, it can be predicted, although the material is given the exact same knowledge, but with the addition of motivation and tools for demonstration asthma inhaler, the experimental-group will have the knowledge, motivation, and ability demonstrations inhalers better than the control group. The statistical analysis in this study using two parameters, i.e. the p-value and size effects. Reasons for using these two parameters is the least number of samples obtained, so that the need for additional parameters besides clarify the difference p-value for both groups after the intervention.

Table 5 and Figure 2 shows a comparison of the values obtained between control and experimental group during the study. Shortly after the intervention, knowledge scores increased significantly, with a high effect size in both groups and scores of knowledge that persist during follow-up. In comparison, after the intervention, the experimental group had no significant difference with the knowledge of the control group ($p = 0.205$), but the effect size between the two mediums ($\Delta = 0578$). Size effect between the two became small after follow-up ($\Delta = 0.345$).

Table 4 and Figure 3 shows a comparison of the values obtained between control- and experimental-group during the study. Unlike the scores of knowledge, participants began the study with a high motivational value. No significant differences in motivation in the control group and the intervention at the time of the study.

Table 4 and Figure 4 shows a comparison of the values obtained between control and experimental group during the study. Post-intervention experimental group the average value is higher, where although there is no significant difference between the two groups ($p = 0.098$),

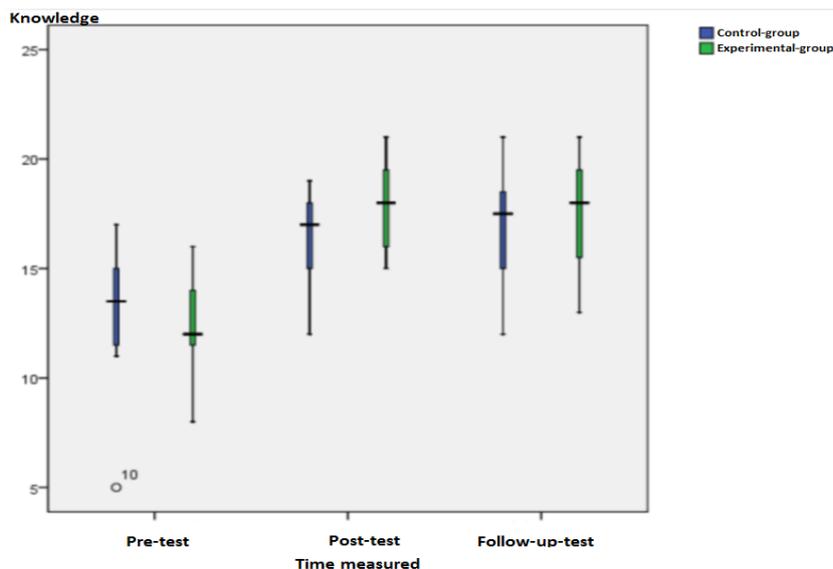


Figure 2: Box-plot Diagram Comparison of Knowledge Change Control-Group and Experimental-Group.

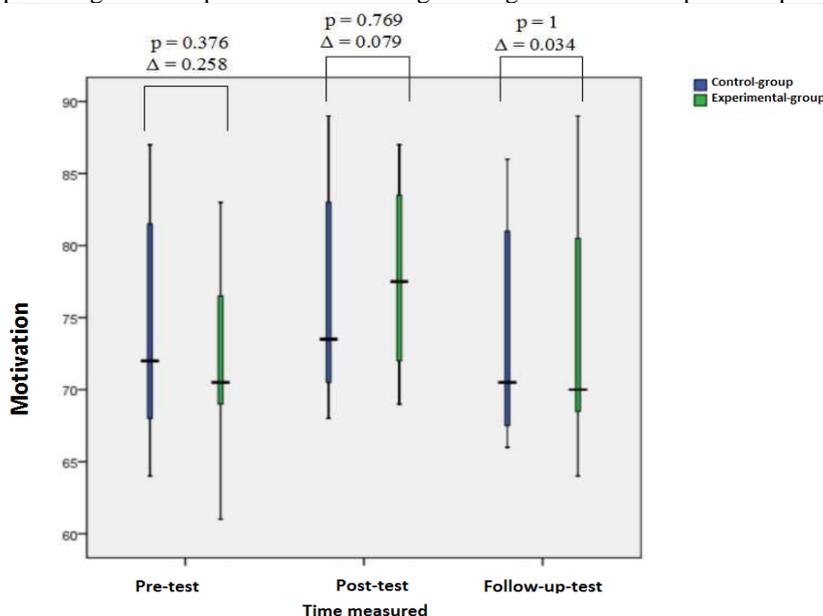


Figure 3: Box-plot Diagram Comparison of Motivation Change Control-Group and Experimental-Group.

but it has a medium effect size ($\Delta = 0.664$). Differences in the two groups more visible on the follow-up, with a large effect size ($\Delta = 0.808$), but still not significant. ($P = 0.098$). Table 4 and Figure 5 shows a comparison of the values obtained between control and experimental group during the study. In the initial condition, only 2 (15:38%) of the control group and 3 (25%) of the experimental group were able to explain all the critical step in correctly. Both increased after the intervention to 10 (76.92%) and 12 (100%), there was no significant difference between them ($p = 0,076$). After follow-up, there was a decrease in the number of pharmacists who can explain the critical step in the control group (5 (38.46%)) when compared to the experimental-group (10 (83.33%)). Number of pharmacists who are able to explain all the critical steps to follow-up the use of MDI significantly more than the control group ($p = 0,022$).

Knowledge Changes

Both groups achieved an increase of the knowledge about asthma inhaler after educated. Although the two groups did not differ significantly pharmacists, but medium effect size seen, showing the experimental group achieve a higher score This is interesting because the educational content provided similar. Differences in the two groups at the time of the intervention is the motivation. Giving thought to affect the motivation of this knowledge score difference. Each Knowledge and motivation of individuals may affect³¹. There is a linear relationship between increased motivation and improved knowledge³². Motivation is known to trigger the willingness to achieve the target, increasing educational efforts and resilience during the ongoing tendency resolve what is learned, improve cognitive processes (attention to education) and improved performance³³. in general, the more enthusiastic the experimental group during the educational process takes place with a number of question and answer do. In contrast

Table 5: Knowledge, Motivation, and The Ability of Pharmacists to The Currently Pre-Test, Post-Test and Follow-Up - Test.

		Parameter				
		Knowledge Score (mean + SD)	Motivaion Score (mean + SD)	total score MDI Demonstration (mean + SD)	Critical Step MDI	
Pre-test	Control-group (n:13)	12.8462	± 74.9231	± 1.9231	± 0 (0%)	
		3.05085	8.41092	2.17798		
	Experimental-group (n:12)	12.5833	± 72.75	± 2.3333	± 0 (0%)	
		2.35327	7.25039	1.82574		
P-value		0.627	0.376	0.422		
<i>Glass size effect</i>		0.086	0.251	0.188		
Post-test	Control-group (n:13)	16.6923	± 77.0769	± 6.3846	± 10	
		1.97419	7.37633	1.80455	(76.92%)	
	Experimental-group (n:12)	17.8333	± 77.6667	± 7.5833	± 12 (100%)	
		2.03753	6.44323	1.62135		
P-value		0.205	0.769	0.098	0.076	
<i>Glass size effect</i>		0.578	0.079	0.664		
Follow-up-test	Control-group (n:13)	16.8462	± 73.9231	± 5.0769	± 5 (38.46%)	
		2.37508	7.34236	1.65638		
	Experimental-group (n:12)	17.6667	± 73.6667	± 6.4167	± 10	
		2.49848	8.35935	2.10878	(83.33%)	
P-value		0.877	1	0.052	0.022	
<i>Glass size effect</i>		0.345	0.034	0.808		

to the control group which has a tendency to quickly complete the process of education and tend to feel uncomfortable during the process.

Motivation Changes

As the preceding discussion, the pharmacist who followed the intervention has had a high motivation score before intervention. It is difficult for the measurement of the difference between the two groups. There is no significant difference between the two groups after the intervention, and the effect size did not indicate any difference. Greater knowledge of the experimental group could indicate that there is actually an increase in the experimental group increased motivation, but the limitations of the sample and the profile of pharmacists pre intervention becomes prohibitive factor to see the difference.

MDI Demonstration Capabilities

This study uses two parameters, namely the total score, indicating how much the average successful deployment steps described pharmacists properly and the number of pharmacists who managed to explain all the critical step. Measurement critical step is necessary because if not done properly by the patient, the amount of drug that reaches the site of action is much reduced. At MDI, critical step includes opening the lid, whisk inhaler (for particles in inhomogeneous), and pressing the canister along with inhaling slowly simultaneously (failure of coordination or breathe rapidly will cause the collision of particles in a cavity of oropharyngeal in bulk)³⁴⁻³⁵.

Changes MDI Demonstration Capabilities

Demonstrations ability both groups increased significantly after the intervention, there was no significant difference between them both on the score demonstration of the total, and the number of pharmacists who are able to demonstrate a critical step to the right. medium effect size ($\Delta = 0664$) were seen in the comparison between the two

groups in total score and the average score higher indicates that the experimental group can demonstrate the technique using MDI better, but the amount of samples are needed to confirm this.

The difference between the two groups is clearly visible on the follow-up, or 3 weeks post-intervention. Demonstrations ability of pharmacists in the control group decreased and widen the differences between the two groups so that large effect size was detected ($\Delta = 0808$). Drastic decrease in the number of pharmacists who can explain the critical step also occurs (down from 76.92% to 38.46%) when compared with the experimental-group (100% to 83.33%) ($p = 0.022$). The experimental group had better skills retention.

The difference between the two groups is seen at 3 weeks post-intervention. When compared with the control group, the experimental group demonstrations score higher across the inhaler, with a medium effect size except MDI (high size effect). There are significant differences in the total score rotahaler demonstration. Given that the data retrieval performed 3 weeks after the intervention of a sudden, without notifying beforehand, showed that the experimental group better prepared to explain the use of inhaler technique. Compared with previous studies granted to pharmacists²³ and other health professionals³⁶ engineering education by using IMB promising, but it takes time to achieve the desired effect³¹.

This data also shows that the tools to explain the step demonstration of inhaler can improve the skills demonstration IMB inhaler as in theory. During the intervention, these tools get good reception of the participants of the experimental group. They refer to tools created is something that is innovative and helps them demonstrate penggunaan asthma inhaler technique,

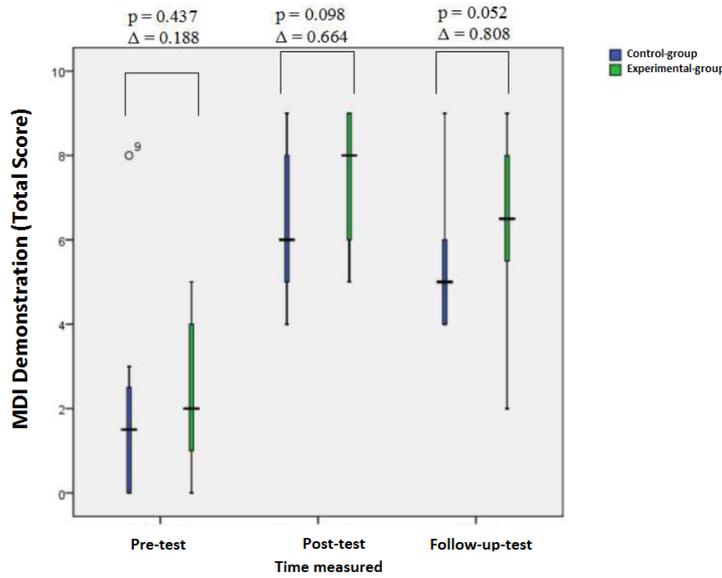


Figure 4: Box-plot Diagram Comparison of Change of MDI Demonstration Capability (Total Score) in Control-Group and Experimental-Group.

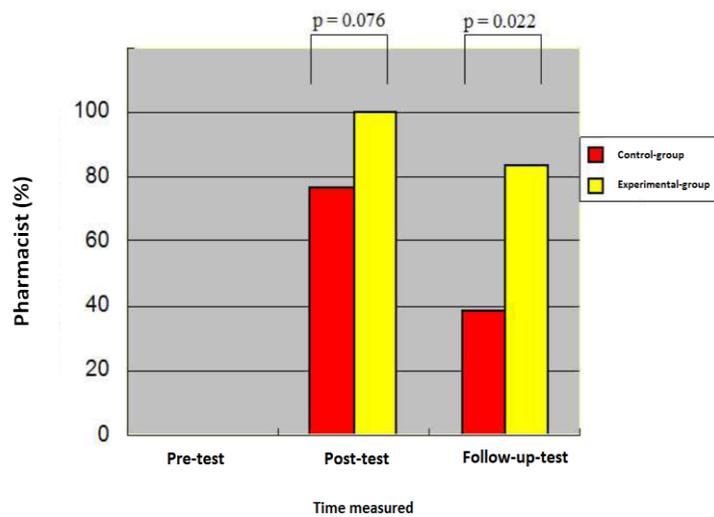


Figure 5: Box-plot Diagram Comparison of Change of MDI Demonstration Capability (Critical Step) in Control-Group and Experimental-Group.

replacing the role of brochures and dummy inhaler. One participant also mentioned that this tool increased participants confidence when dealing with patients with asthma.

Research Limitations

The aim of the intervention is to encourage a change in attitude so that pharmacists have the drive and skills to explain the technique using the inhaler to patients, but it is difficult to do in Surabaya. Previous research that assesses the completeness of the information provided by the pharmacy personnel, especially pharmacists²⁴⁻²⁶, shows that of the total sample is only partially pharmacists, while the rest are other pharmacy personnel because pharmacists are not in place or are not willing to meet. There are also other limitations in this study is related to the sample used in the study. The number of samples is too little, causing difficulty in achieving the necessary statistical power. The

number of community pharmacists who do not stand by in Surabaya also disrupt the use of the results of this study. The effect of the IMB model of education to community pharmacists pharmacists-who did not stand by, which is predicted to have the value of knowledge, motivation and skills demonstrations lower than the samples still need to be further investigated. Acceptance of wages or salaries are not comparable with the energy that must be removed is estimated to be the reason why so many pharmacists who do not stand by in Surabaya³⁷⁻³⁸. Pharmacist-pharmacists who stand by and refuse to participate in the intervention, refused for reasons workload undertaken by community pharmacists. The absence of community pharmacists who feel they have a high workload also be other limitations because of the type of community pharmacists as is expected derive great benefit from the intervention.

CONCLUSION

Based on the data obtained, three things can be concluded from this study are: There is no difference in the improvement of knowledge and motivation regarding asthma inhalers among education-based IMB and a knowledge-based, but the pharmacists who intervened with the model-based educational IMB to demonstrate the technique using the inhaler is better than knowledge-based education,

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