



Original Article

The Influence of Health Education Based on Health Belief Model Theory on Behavior to Prevent Postoperative Complications

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ABSTRACT

The danger of postoperative complications can prolong the healing process so prevention is needed by improving patient behavior. Health education based on the Health Belief Model can be applied to improve behavior based on patient perceptions. This research aims to prove the effect of health education based on the Health Belief Model theory on behavior to prevent postoperative complications with spinal anesthesia. This research used a True Experiment design with a Pretest-Posttest Control Group Design approach involving 60 respondents taken using a simple random sampling technique. The results of the analysis prove that there is an influence of health education based on the Health Belief Model theory on behavior to prevent postoperative complications with spinal anesthesia. The health education provided increases respondents' knowledge about preventing post-operative complications, and with the knowledge they have, it encourages respondents to improve their attitudes and behavior in preventing postoperative complications with spinal anesthesia.



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INTRODUCTION

Surgery is an invasive procedure that involves making an incision to open and expose the part of the body that will be treated.¹ During the postoperative recovery period, patients have a high risk of postoperative complications. Complications that occur can be caused by several factors such as the surgical procedure itself, medications used before and during the procedure, or immobility during and after the procedure ². The danger of postoperative complications can prolong the healing process thereby increasing medical costs, affecting surgical results, reducing life expectancy and quality of life.³ Surgical complications in developed countries are estimated to reach 3-16% with a death rate of 0.4-0.8%, in one year major complications reach 7 million patients and include 1 million patients who die during or after surgery. Meanwhile, the death rate in developing countries due to surgical complications is estimated to be much higher, ranging from 5-10% with a complication rate of 3-16%.⁴

Postoperative complications with spinal anesthesia include unexpected cardiac arrest (cardiac arrest), neurological risks, Postoperative Nausea and Vomiting (PONV), Postdural Puncture Headache (PDPH), urinary retention, and hearing and eye complications ⁵. Based on research at the Jatiwinangun Special Surgical Hospital, PONV complications in postoperative patients with spinal anesthesia reached (57.9%) of respondents, the incidence of PDPH was (29.8%), and as many as (31.6%) of respondents experienced urinary retention.⁶ Various efforts

can be made to reduce the risk of postoperative complications, one of which is preventive measures that can be taken by nurses or patients. Patients who are going to undergo surgery need to know what they will experience and what behaviors they can or cannot do.

The process of changing or improving a person's health behavior is not an easy thing, because an individual's behavior is influenced by several factors such as knowledge, beliefs, attitudes, traditions as well as the individual or community concerned ⁷. A very influential and important domain in the process of forming behavior is the cognitive or knowledge domain. An individual's knowledge will be formed after they sense a particular object, either based on what they hear and see, or through their sense of smell, taste or touch ⁸. The process of providing information by nurses to patients is called health education. Health education is an intervention that can influence other people, whether individuals, groups or communities, so they can do what is expected by the person who has provided health education.⁹ Health education aims to make individuals and communities aware of how to behave in maintaining health, how to avoid and prevent anything that can harm their health and that of others ¹⁰.

The success of preoperative health education activities carried out by nurses must also be followed by the contribution and trust of the patient, whether the patient after the surgery has been completed will improve their behavior in preventing postoperative complications or not, because it depends on the patient's perception of the health education activity whether it provides benefits, harm or have an influence on him. Perceptions and beliefs about something that happens can be described in terms of the Health Belief Model theory. In 1996 Rosentock first put forward the Health Belief Model theory which was then refined by Becker in 1970 and 1980. The concept of the Health Belief Model theory is that health behavior is determined by the individual's perception of their beliefs about disease and what means of treatment to reduce the symptoms of the disease they are experiencing.¹¹ An individual's beliefs and perceptions on something can drive a person's action plans.⁷

The Health Belief Model consists of 6 main elements, these elements are used by researchers as a concept to improve the behavior of preventing postoperative complications with spinal anesthesia for patients, firstly perceived susceptibility, in this element the risk is conveyed if the patient does not participate in preventing complications or when the patient does not cooperative, second is perceived severity, namely conveying what complications might occur, third, perceived benefits, namely explaining the benefits that the patient will get from each preventive action. The fourth element is perceived barriers, namely by identifying obstacles experienced by patients and helping patients overcome them, the fifth element is cues to action, namely by facilitating health education activities for patients and communicating with families to provide support to patients, and the sixth is the ability of self-efficacy, namely by helping patients to convince themselves that they are capable and confident that they can prevent postoperative complications with spinal anesthesia.

The application of the Health Belief Model theory in providing health education is a researcher's concept in the form of nursing interventions used to change behavior based on patient perceptions and beliefs whose approach is in the form of health education.¹² This strategy is expected to improve patient behavior in preventing postoperative complications with spinal anesthesia, thus helping the recovery process after surgery. Based on this description, researchers are interested in conducting research on the effect of providing health education based on the Health Belief Model theory on patient behavior in preventing postoperative complications with spinal anesthesia.

METHODS

This type of research uses a True Experiment design with a Pretest-Posttest Control Group Design approach. This research was conducted at the Wava Husada Kepanjen Hospital, Malang Regency from March to April 2024. The population in this study included all elective preoperative patients under regional spinal anesthesia at the Wava Husada Kepanjen Hospital which estimates the population in the last year namely in 2023 there will be 4755 surgical patients with spinal anesthesia with an average of 396 patients per month. The process of determining the sample in

this research uses Roscoe's (1975) theory, guided by practical rules, namely, research sample $30 < n < 500$. Roscoe's theory states that a suitable sample size in research is between 30 and 500 people and for simple experimental research using a control group and an intervention group, the number of members in each sample is between 10-20.¹³ Based on this theory, the minimum sample size in this study is 10 samples in each group. However, in this research, 60 samples will be used, namely 30 respondents for the intervention group and 30 respondents for the control group to improve the accuracy of the questionnaire results. The sampling process in this study used a simple random sampling technique.

The independent variable in this research is health education based on the Health Belief Model theory. The dependent variable in this study is behavior to prevent postoperative complications with spinal anesthesia. The research instrument used for the independent variable was the guidance for the extension program unit and used leaflet media containing material about types of postoperative complications with spinal anesthesia, prevention of postoperative complications including early mobilization, proper post-operative nutritional care, effective coughing, and deep breathing relaxation. Health education media is a tool that can be used by educators in the process of delivering learning materials.¹⁴ The method used is the individual education method.

The research instrument used for the dependent variable is a questionnaire which is divided into 3 domains including knowledge, attitudes and actions. The instruments used have been tested for validity and reliability and declared valid and reliable. Univariate analysis was used to determine the frequency and percentage distribution of age, gender, education, occupation, as well as a general description of respondents' behavior regarding preventing postoperative complications. The first bivariate analysis used was the Wilcoxon Signed Rank Test to determine the comparison of two paired samples, namely the results of the pretest and posttest in the intervention group and the control group and to determine the differences in behavior to prevent postoperative complications with spinal anesthesia in the intervention group and the control group using Mann Whitney U Test analysis. This research has been ethically tested by the Health Polytechnic Ethics Commission of the Ministry of Health of Malang and was declared ethically appropriate with number No.DP.04.03/F.XXI. 31/0268/2024.

RESULTS

Table 1. Frequency distribution of preoperative characteristics of respondents (n=60)

Variables	Intervention Group		Control Group	
	f	%	f	%
Gender				
Man	0	00.0	3	10.0
Women	30	100	27	90.0
Age				
Young Adult (20-44 Years)	27	90	29	96.7
Old Adult (45-64 Years)	3	10	1	3.3
Education				
Elementary School	0	00.0	6	20.0
JHS	3	10.0	3	10.0
SHS	19	63.3	14	46.7
College	8	26.7	7	23.3
Job				
Housewife	20	66.7	19	63.3
Teacher	4	13.3	5	16.7
Private	4	13.3	4	13.3
Entrepreneur	1	3.3	1	3.3
Villages Officials	0	00.0	1	3.3
Translator	1	3.3	0	00.0
Information on preventing complications				
Yes	0	00.0	5	16.7
No	30	100.0	25	83.3

Based on Table 1, it shows that in the intervention group, all respondents were women with a total of 30 respondents (100%), while in the control group, the majority were women, 27 (90%) respondents and the remaining 3 respondents (10%) were men. Based on age in the intervention group, most of the respondents were in the young adult age category (20-44 years) with 27 respondents (90%), in the control group it also showed that some respondents were in the young adult age category (20-44 years) with 29 respondents (96.7%). Characteristics of respondents based on their latest education, it is known that in the intervention group more than half of the respondents had a Senior High School education with 19 respondents (63.3%) and in the control group less than half of the total respondents had a Senior High School education with 14 respondents (46.7%). The frequency of work of respondents in the intervention group is that more than half are Housewives with 20 respondents (66.7%) and in the control group it is almost the same, more than half of the total respondents are Housewives (IRT) with 19 respondents (63.3%).

The next general data obtained was regarding the respondents' experiences, whether they had ever or never received information about preventing postoperative complications with spinal anesthesia. The results showed that in the intervention group, a total of 30 respondents (100%) had never received health education regarding preventing postoperative complications with spinal anesthesia, in the control group, the majority of respondents 25 respondents (83.3%) had never received health education regarding preventing postoperative complications with spinal anesthesia.

Based on research data that has been obtained, it is known that in the intervention group before being given the intervention, the results of the pretest showed that more than half of the respondents had knowledge in the poor category, namely 16 respondents (53.3%) and after being given health education based on the Health Belief Model theory and carried out a posttest, the results showed that most respondents had knowledge in the good category, namely 24 respondents (80.0%). In the control group, the pretest results showed that more than half of the respondents had knowledge in the poor category, namely 22 respondents (73.3%) and after the posttest, more than half of the respondents still had knowledge in the poor category of 20 respondents (66.7%).

Research results in the intervention group before being given the intervention, the pretest results of the respondents showed that more than half of the respondents had an attitude in the average category with a total of 17 respondents (56.7%) and after being given health education based on the Health Belief Model theory and carried out a posttest, the results showed that most respondents had an attitude in the good category with a total of 24 respondents (80.0%). In the control group, the pretest results showed that half of the total respondents had an attitude in the poor category, namely 15 people (50%) and the posttest results showed that more than half of the respondents had an attitude in the average category, namely 16 people (53.3%).

Research results in the intervention group, before being given the intervention, the pretest results of the respondents showed that half of the respondents had action in the average category, namely 15 respondents (50.0%) and after being given health education based on the Health Belief Model theory, the posttest results showed that all 30 respondents (100.0%) had action in the good category. In the control group, the pretest results showed that more than half of the respondents had action in the poor category, namely 18 people (60%) and the posttest results showed that half of the total respondents still had action in the poor category, namely 15 people (50.0%).

Based on Table 2, it shows the results of statistical tests on behavior (knowledge, attitudes and actions) of patients in the intervention group. The results of the analysis test using the Wilcoxon Signed Rank Test in the knowledge domain showed that $p = 0.000$ was smaller than $\alpha = 0.05$, which means there was a significant difference in knowledge scores between the pretest and posttest results in the intervention group. In the attitude domain, the results show a value of $p = 0.000$ which is smaller than $\alpha = 0.05$, which means there is a significant difference in attitude scores between the pretest and posttest results in the intervention group. In the action domain, the results show a value of $p = 0.000$ which is smaller than $\alpha = 0.05$, which means there is a significant difference in action scores between the pretest and posttest results in the intervention group.

Table 2. Differences in patient behavior (knowledge, attitudes, and actions) in preventing postoperative complications with spinal anesthesia in the intervention group and control group (n=30)

Category	Intervention Group			Control Group		
	Min	Max	p Value Wilcoxon Signed Rank Test	Min	Max	p Value Wilcoxon Signed Rank Test
Knowledge						
Pretest	1	10	0.000	1	8	0.302
Posttest	7	10		3	8	
Attitudes						
Pretest	19	40	0.000	19	32	0.200
Posttest	27	40		19	32	
Action						
Pretest	18	37	0.000	19	31	0.179
Posttest	34	40		17	31	

Based on Table 2, it shows the results of statistical tests on behavior (knowledge, attitudes and actions) of patients in the intervention group. The results of the analysis test using the Wilcoxon Signed Rank Test in the knowledge domain showed that $p = 0.000$ was smaller than $\alpha = 0.05$, which means there was a significant difference in knowledge scores between the pretest and posttest results in the intervention group. In the attitude domain, the results show a value of $p = 0.000$ which is smaller than $\alpha = 0.05$, which means there is a significant difference in attitude scores between the pretest and posttest results in the intervention group. In the action domain, the results show a value of $p = 0.000$ which is smaller than $\alpha = 0.05$, which means there is a significant difference in action scores between the pretest and posttest results in the intervention group.

Based on Table 2, it shows the results of statistical tests on behavior (knowledge, attitudes and actions) of patients in the control group. The results of the analysis test using the Wilcoxon Signed Rank Test in the control group showed that $p = 0.302$ was greater than $\alpha = 0.05$, which means there was no significant difference in knowledge scores between the pretest and posttest results in the control group. In the attitude domain, the result was a value of $p = 0.200$ which was greater than $\alpha = 0.05$, which means there was no significant difference in attitude scores between the pretest and posttest results in the control group. In the action domain, the results obtained were $p = 0.179$ which was greater than $\alpha = 0.05$, which means there was no significant difference in action scores between the pretest and posttest results in the control group.

Table 3. Differences in patient behavior (knowledge, attitudes and actions) in preventing postoperative complications with spinal anesthesia in the intervention group and control group (n=60)

	Mean	p Value Mann Whitney U Test
Knowledge		
Intervention Group Posttest	16.50	0.000
Control Group Posttest	44.50	
Attitudes		
Intervention Group Posttest	16.15	0.000
Control Group Posttest	44.85	
Action		
Intervention Group Posttest	15.50	0.000
Control Group Posttest	45.50	

Based on table 3, it is known that the results of the analysis test using the Mann Whitney U Test on the results of the intervention group posttest and control group posttest. The results of the analysis test show that the p-value in the knowledge, attitude and action domains is 0.000, where the p value result is smaller than $\alpha = 0.05$, which means there is a difference in patient

behavior in preventing postoperative complications with spinal anesthesia in the intervention group and the control group, there is a difference. This proves that there is an influence of health education interventions based on the Health Belief Model theory on the behavior of preventing postoperative complications with spinal anesthesia in preoperative patients at Wawa Husada Kepanjen Hospital.

DISCUSSION

Patient behavior (knowledge, attitudes and actions) in preventing postoperative complications with spinal anesthesia before and after being given health education based on the Health Belief Model theory in the intervention group.

Patient behavior in preventing postoperative complications with spinal anesthesia in the intervention group before being given the intervention, namely more than half of respondents in the knowledge domain had poor knowledge and after being given health education based on the Health Belief Model theory, most respondents had good knowledge, in the attitude domain more than half of the respondents had attitudes in the poor category and after being given health education based on the Health Belief Model theory, most of the respondents had attitudes in the good category. In the action domain, half of the respondents had action in the average category and after being given health education based on the Health Belief Model theory, all respondents had action in the good category. The pretest behavior scores (knowledge, attitudes and actions) of patients in preventing postoperative complications with spinal anesthesia in the initial intervention group were mostly in the poor category, this result could be caused by educational factors or the respondent's experience in obtaining information about the behaviour of preventing postoperative complications with spinal anesthesia.

Education is a process of applying concepts according to the field, the basic concept of education is a learning process which means that in education there is a process of growth, development or change towards a more mature, better, more mature individual, group or society. The higher a person's level of education, the higher their awareness of health. Both for himself and others and family. Educational background influences a person's thinking and acting, and through education a person can increase intellectual maturity to make better behavior decisions.¹⁵ Based on the results of this study, the researcher believes that the health education given to preoperative patients with spinal anesthesia aims to ensure that patients have knowledge about preventing postoperative complications, so that with the knowledge they have, it will encourage respondents to behave well and positively starting from the attitudes and actions of respondents in Prevention of postoperative complications with spinal anesthesia.

Patient behavior (knowledge, attitudes, and actions) in preventing postoperative complications with spinal anesthesia before and after in the control group.

Patient behavior in preventing postoperative complications with spinal anesthesia in the control group showed that the pretest results in the knowledge domain showed that more than half of the respondents had knowledge in the poor category and after the posttest was carried out more than half of the respondents still had knowledge in the poor category, in the attitude domain the pretest results showed that half of the total respondents had an attitude in the poor category and posttest results showed that more than half of the respondents had an attitude in the average category. In the action domain, the pretest results showed that more than half of the respondents had actions in the poor category and the posttest results, half of the respondents still had action in the poor category. Human behavior has a broad scope because human behavior is a very complex thing. Behavior itself consists of 3 important domains, namely knowledge, attitudes and actions. In its development, an individual's way of behaving can change depending on what allows these changes to occur, human behavior can experience changes caused or influenced by internal and external factors ⁷. Behavior change strategies can be carried out in various ways, strategies that can be carried out include enforcement, namely strategies carried out to change the way of behavior that is forceful in nature and by implementing legal policies. Next is education, which is

a behavior change strategy achieved through the teaching and learning process, namely by providing information or providing health education ⁷.

Based on the results of this research, in the researcher's opinion, the results of the posttest behavior of respondents in the control group who were not given intervention still had a lot of knowledge in the deficient category. This causes respondents not to know how to behave appropriately in terms of attitudes and actions in preventing postoperative complications with spinal anesthesia. Providing education or health education to preoperative patients is a strategy that can be used to improve patient behavior. Providing information through health education will increase patient knowledge so that it will encourage respondents to behave well in preventing postoperative complications with spinal anesthesia.

Differences in patient behavior (knowledge, attitudes, and actions) in preventing postoperative complications with spinal anesthesia in the intervention group.

The results of the analysis using the Wilcoxon Signed Rank Test in this study showed that there was a significant difference between the pretest and posttest of patient behavior in preventing postoperative complications with spinal anesthesia in the intervention group after being given health education based on the Health Belief Model theory regarding behavior in preventing postoperative complications with spinal anesthesia. Providing health education based on the Health Belief Model theory or providing health information that focuses on patient beliefs and perceptions is a form of effort that nurses can make for patients in preventing post-operative complications with spinal anesthesia. Perceptions and beliefs greatly influence a person in making decisions, for example in the health sector. A person who gets the right information, assesses conditions and situations related to something that threatens his health, will form behavior that also leads to prevention efforts ¹⁶.

The results of this study are supported by previous research which shows that there are differences in knowledge before and after being given health counseling and coaching education based on the Health Belief Model theory in the intervention group ¹⁷. Previous research also said the same thing, based on the results of statistical tests, a value of $P = 0.000 < 0.05$ was obtained, which means that providing health by implementing The Health Belief Model is effective in increasing the knowledge of families of pulmonary TB sufferers ¹⁸. Health education based on the Health Belief Model theory is a concept of providing information to respondents by emphasizing a person's beliefs and attitudes in behavior, especially regarding health behavior. An individual's beliefs and perceptions on something can drive a person's action plans.⁷ The Health Belief Model is a theory that is most often applied to health education, health education, and disease prevention activities ¹⁹. Education using the Health Belief Models approach has long been identified as one of the earliest influential models in health promotion. This model has been used with great success for almost half a century to promote condom use, seat belts, medical compliance, health screening use ²⁰. When the Health Belief Model is applied to health behavior, an individual will begin to carry out activities that lead to improving health and preventing disease and trying to avoid disease ²¹.

Differences in patient behavior (knowledge, attitudes and actions) in preventing postoperative complications with spinal anesthesia in the control group.

In the control group, the results of the analysis showed that there was no significant difference between the pretest and posttest of patient behavior in preventing postoperative complications with spinal anesthesia in the control group. Knowledge is the result of knowing and is formed when an individual has recognized or sensed an object. A person will not have a basis for making decisions or determining actions when facing problems if they do not have knowledge ²². Attitude is defined as a person's response that is still closed to a stimulus or object. Attitudes will not be formed before someone obtains information, sees or experiences an object for themselves ²³. An attitude has not yet been directly realized in an action. To make an attitude into a real action, supporting factors or adequate facility conditions are needed ⁷. A person's or society's behavior towards health is influenced by the knowledge, attitudes, traditions and so on of the individual or the society concerned. Apart from that, the existence of facilities and attitudes

and behavior of health workers towards health will support and support the formation of actions and behavior ⁷.

Based on the description above, in the researcher's opinion, there is no significant difference between the pretest and posttest results in the control group because in this group no intervention was given, so the majority of respondents in the control group did not have sufficient knowledge about preventing postoperative complications with spinal anesthesia, so respondents did not know what could be done to prevent postoperative complications with spinal anesthesia. Therefore, providing health education or health education regarding preventing postoperative complications with spinal anesthesia from nurses is important to increase patient knowledge so that it will shape patient attitudes and actions or what is also called patient behavior.

The results of this research are in line with previous research on the effectiveness of the Health Belief Model (HBM) in improving the personal hygiene of clients at the BNN Batam Rehabilitation Center, where the results of the analysis in the control group were obtained, namely the p value of knowledge, perception and attitude > 0.05 which had meaning there are no differences in knowledge, perceptions and attitudes during the pretest and posttest ²⁴.

Differences in patient behavior (knowledge, attitudes and actions) in preventing postoperative complications with spinal anesthesia in the intervention group and the control group.

Based on the results of analysis tests to determine differences in patient behavior in preventing post-operative complications with spinal anesthesia in the control group and the intervention group who had been given health education based on the Health Belief Model theory regarding behavior in preventing post-operative complications with spinal anesthesia, it shows that there is a significant difference in patient behavior in preventing Postoperative complications with spinal anesthesia between the intervention group after being given health education based on the Health Belief Model theory and the control group (not given intervention). This research study shows that health education based on the Health Belief Model theory among respondents plays an important role in increasing behavior to prevent postoperative complications. Respondents can understand how to behave to prevent postoperative complications through information obtained in health education activities based on the Health Belief Model theory. The knowledge that respondents have after receiving health education as well as the attitudes and actions that respondents have taken can reduce the risk of postoperative complications and speed up the healing process after surgery. Through the results of this research, it is hoped that health workers can provide health education based on the Health Belief Model theory regarding behavior to prevent post-operative complications with spinal anesthesia to pre-operative patients. Apart from that, patients who will undergo surgery are also expected to be able to read, look for information, or receive information provided by health workers. about preventing postoperative complications with spinal anesthesia before carrying out surgery. This aims to improve patient behavior (knowledge, attitudes and actions) and minimize the risk of postoperative complications.

In this research, the researcher realizes that there are still limitations that are important to convey. The inherent limitation of this research is that the researcher cannot control the respondent's answers if the respondent is not honest in answering the statements in the research questionnaire. Apart from that, limited research time and small sample size are also limitations in this research.

CONCLUSION

Based on the results of the research and analysis carried out, it can be concluded that there is an influence of health education based on the health belief model theory on behavior to prevent complications with spinal anesthesia. The use of the Health Belief Model theory in providing health education can be used as an intervention option or effort that nurses in other hospitals can make to increase success in improving behavior in preventing post-operative complications with spinal anesthesia, so as to minimize the risk of post-operative complications with spinal anesthesia. Suggestions for future researchers can be to examine the patient's previous medical

history which can support the patient's knowledge, attitudes and actions regarding preventing post-operative complications with spinal anesthesia, apart from that they can also examine and relate each element of the Health Belief Model to determine the application of the elements of the Health Belief Model which has the most influence in improving patient behavior in preventing postoperative complications with spinal anesthesia.

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