ORIGINAL ARTICLE

Discipline as complete mediation in the implementation of the *Theory Planned Behaviour* of nurse's handwashing compliance

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ABSTRACT

Introduction: Hospital-acquired infection is still one of the health problems in the world that require infection control and prevention efforts, especially nurses' hand washing compliance. Various strategies and efforts to improve handwashing compliance include educational approaches, motivation and improvement of the health care system, one of which is through the use of *The Theory Of Planned Behaviour* application in solving handwashing compliance.

Materials and Methods: Quantitative research with a survey approach and observation of hand washing compliance of all nurses N = 321 with a sample of n = 178 nurses. The research variables studied consisted of intention, discipline, self-assessment, opportunity compliance and implementation of the nurse's hand washing. Nurse handwashing compliance observations were made by Infection Prevention Control Link Nurse (IPCN) committee. Data analysis using structural equation modelling (SEM) with smart partial least square *(SmartPLS 3.0)* application.

Results: The nurse's intention to apply the theory of planned behaviour has no significant effect on the implementation of hand washing with path coefficients of 0.104 and p-value 0.221 > 0.05. The effect of nurses' intentions on the implementation of nurse hand washing through discipline is significant with a value of variance accounted for (VAF) 0.8043 or 80.43 % of nurse discipline is a complete mediation variable.

Conclusion: Discipline as a complete meditation variable in the application of the theory of planned behaviour in the compliance of nurses' hand washing five moments six steps. Nurses are expected to continuously improve their discipline independently or be assisted by training activities facilitated by the hospital.

KEYWORDS:
Intention, Discipline, Self-assessment, Hand washing, Five moments six steps

INTRODUCTION

Hand washing is the most important action in reducing the risk of transmitting microorganisms. Hand contact with blood, body fluids, secretions, excretions and contaminated patient equipment or items is an important indicator of infection prevention and control.[1,2] Nurses' handwashing behaviour in compliance with five moments six steps of hand washing still needs attention, considering that 19% are at risk of causing phlebitis incidents in infusions.[3] About 40% of the spread of germs on hands contributes to cross-infection from health workers.[4] In this case, the WHO has set global (world) efforts and challenges for patient safety through compliance with hand washing.[5]

The low level of nurse handwashing compliance is the basis for a multi-modal approach strategy through education, motivation and improvement of the service system in increasing nurse compliance in handwashing.[6] The theory of planned behaviour is a conceptual framework that aims to explain the determinants of certain behaviours. According to Ajzen[7], the central factor of individual behaviour is that behaviour is influenced by individual intentions (behaviour intention) towards that particular behaviour. The intention to behave is influenced by three components attitude, subjective norm and perceived behaviour control.[7] The development of research using the Theory Of Planned Behaviour application as an effort to identify the role of intention in increasing hand washing compliance has been proven to have a significant effect on the implementation of hand washing and self-report.[8,9]

Discipline is one of the cultural values of work in a military hospital environment that emphasises commitment and obedience to the rules and norms that apply in carrying out health services to patients and families. Discipline is behaviour and discipline by rules and regulations or behaviour obtained from training that is carried out continuously to improve the quality of nursing care.[10] Discipline is widely applied in various conditions to improve the attitude, mentality and motivation of nurses in improving the performance of health services in hospitals.[11,12]

This article was accepted: 11 April 2023
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This study aims to develop and empirically test the role of discipline as a mediating variable in the application of the *Theory Of Planned Behaviour* model of nurses' handwashing compliance in five moments six step hand washing behaviour.

MATERIALS AND METHODS

This research design used quantitative research with a survey approach that studies attitudes, beliefs, values, demographics, behaviour, opinions, habits, desires, ideas and other types of information. The reason for choosing the quantitative method is because it can cover various phenomena on the influence of intention and discipline variables with nurses' hand washing compliance behaviour which aims to test the application of the *Theory Of Planned Behaviour* on various variables studied. The TPB (Theory Of Planned Behaviour) model is used in this study because it can predict, explain and know the behaviour of nurses' hand washing. The population in this study was all nurses working in outpatient and inpatient installations totalling 321 people. Each service installation was taken proportionally where 16 inpatient service units totalled 108 nurses and 17 outpatient service units numbered 70 nurses using the Slovin's sample formula and a margin of error of 5%[13] so that the total sample was 178 nurses. The sampling technique used is proportional random sampling in each service unit outpatient and inpatient installations. Collecting data using surveys and observations on the quality audit of nurses' handwashing compliance by the hospital infection prevention and control committee through the Infection Prevention Control Link Nurse (IPCLN) officer in each room. The results were validated by the Infection Prevention Control Nurse (IPCN) committee.

Data analysis using structural equation modelling (SEM) with Smart Partial Least Square (SmartPLS) application. Mediation test analysis regression analysis of mediating variables using the product of coefficient method developed by Sobel. Therefore, this test is often referred to as the Sobel test. This test was carried out by testing the strength of the indirect influence of the intention variable (X1) on the implementation of hand washing (Y2) through discipline (X2), self-assessment (X3), and hand washing opportunities (Y1).[14]

Testing the significance of the indirect effect of the mediator variable on the dependent variable becomes (ab) with a standard error that will produce a statistical t value. To calculate the standard error ab, the following formula is used. While the t value of the ab coefficient is as follows: If the z test is above 1.96 (absolute z value standard), then there is a mediation effect. The mediation test was used to determine whether Nurse Discipline (X2) as an intervening variable played a role in mediating the Nurse's Intention (X1) variable on the Implementation of Nurse Handwashing (Y2).[14]

The involvement of mediating variables in a study has three criteria models:

1. Complete mediation, namely the independent variable, is not able to give a significant influence on the dependent variable directly without going through the mediating variable.
2. Partial mediation, namely the independent variable, can give a direct influence on the dependent variable without involving the mediating variable.
3. No mediation: There is no effect of mediating variables

The way to find out the value of the mediation variable can use the formula below.VAF = a x b/ a x b x c. The results of the calculations in the VAF formula are then adjusted to the criteria for the involvement of the research mediating variable in Table I.[15]

Ethical Approval

As a scientific activity that involves humans as subjects, this research had received ethical approval before data collection was carried out, namely from the Health Research Ethics Commission of *Poltekkes Kemenkes Malang,* Indonesia, 18/11/2022. Ethical approval was given based on the results of an evaluation conducted by the board of ethics examiners, which concluded that this study had implemented ethical principles of health research, including: upholding autonomy, not harming, maintaining justice and providing benefits to respondents. All participants also agreed to be involved as research subjects by completing informed consent, after previously being explained about the objectives and benefits of this study

RESULTS

All research hypotheses have a direct and positive significant effect, except for the hypothesised value of the Influence of Nurses' Intentions (X1) on the Implementation of Nurse Handwashing (Y2) with a SmartPLS Coefficient of 0.104. Given the p-value of 0.221 > 0.05, the coefficient is negative, meaning that the Nurse's Intention (X1) has no significance and negative effect on the Implementation of Nurse Handwashing (Y2). The higher the Nurse's Intention (X1), the lower the Nurse's Handwashing Implementation (Y2) (Figure 1).[16]

The indirect effect of Nurse Intentions (X1) on the Chances of Washing Nurse's Hands (Y1) through the mediation of Nurse Discipline (X2) with a direct effect coefficient value of 0.237 plus an indirect effect coefficient value of 0.186 = 0.423. Then the value of variance accounted for (VAF) is 0.186 : 0.423 = 0.440 or 44%. Considering the provision that the VAF value is between 20%≤ VAF <80%, it is concluded that nurse discipline (X2) is a partial mediating variable. The indirect effect of nurse intention (X1) on self assessment of handwashing (X3) through the mediation of nurse discipline (X2) with a direct effect coefficient value of 0.202 plus an indirect effect coefficient value of 0.286 = 0.488. Then the value of VAF is 0.202 : 0.488 = 0.414 or 41.4%. Considering the provision that the VAF value is between 20%≤VAF<80%, it is concluded that nurse discipline (X2) is a partially mediating variable. The indirect effect of Nurse Intention (X1) on the Implementation of nurse handwashing (Y2) through the mediation of nurse discipline (X2) with a direct effect coefficient value of 0.108 plus an indirect effect coefficient value of 0.444 = 0.552. Then the value of VAF is 0.444 : 0.552 = 0.8043 or 80.43%. Considering the provision

Table I: Variance accounted for (VAF) criteria

Criteria	Information
VAF < 20%	No mediation
20% ≤ VAF ≤ 80%	Partial mediation
VAF > 80%	Complete mediation

Source: SmartPLS Analysis Output Results, 2022[14]

Table II: Analysis smartPls indirect effect

	X1	X2	X3	Y1	Y2
X1			0.202	0.332	0.444
X2				0.098	0.181
X3					0.074
Y1					
Y2					

Source: SmartPLS Analysis Output Results, 2022[14]

that the VAF value is between 20%≤VAF<80%, it is concluded that nurse discipline (X2) is a complete mediation variable (Table II).[16]

The magnitude of the influence of nurses' intentions (X1), nurse discipline (X2), and self-assessment of handwashing (X3) on the opportunity of handwashing nurses (Y1) is 0.488 or 48.8%. The magnitude of the influence of nurses' intentions (X1), nurse discipline (X2), self-assessment of handwashing (X3), and nurse handwashing opportunities (Y1) on the implementation of nurse handwashing is 0.551 or 55.1% (Table III).[16]

DISCUSSION

The results of the SmartPLS analysis prove that the nurse's intention has no significant effect on the implementation of nurse handwashing with path coefficients of 0.104 and a p-value of 0.221 > 0.05. The coefficient value which is too small at 0.104 states that the nurse's intention to contribute to the implementation of nurse hand washing is only 10.4%. The rest comes from other variables. This means that the higher the nurse's intention tends to be able to increase the implementation of nurse hand washing, but the increase is not significant. The results of this study do not support research that states that intention has a significant effect on nurses' compliance with washing.[9,17–19] These results confirm the theory of planned behaviour which states that intention is a description of the motivational factors that a person has that underlies how hard a person tries to try and plan his efforts to display behaviour.[20,21] The empirical data of this study cannot prove that the high intention of nurses can increase the implementation of hand washing. This means that the higher the nurse's intention does not significantly increase the implementation of nurse hand washing. Age, education, attitude and gender can be factors that affect the nurse's intention to comply with hand washing.[22]

The nurse's intention to carry out handwashing is influenced by the variables of discipline mediation, self-assessment and the opportunity for nurses to wash their hands. This theory does not support the effect of intention on hand-washing compliance. Nurses' intentions do not always underlie the formation of nurse compliance in washing hands but are influenced by other variables in the formation of handwashing compliance. The existence of self-assessment and the opportunity to wash hands can reduce the risk of infection in the hospital.

The results of the SmartPLS analysis prove that the discipline of nurses has a significant positive effect on the implementation of hand washing. The path coefficients are 0.293 and the p-value is 0.000 > 0.05. The estimated value with a positive sign of 0.293 indicates that nurses with high hand-washing discipline will have high hand-washing practices as well. This study supports the discipline concept of Thomas Gordon[23] namely behaviour and discipline by the rules and regulations or behaviour obtained from training. Humans living in this world need norms and rules as guidelines and directions to climb the path of life, as well as nurses if a nurse wants high handwashing compliance then he must have discipline, especially high discipline. In this case, discipline is an attitude of respecting and obeying all. The results of this study are also in line with research studies that state that the impact of Covid 19 is that nurses are more disciplined and motivated in the performance and implementation of hand washing in hospitals.[24,25] He shows that nurses can be consistent in maintaining motivation and behavioural discipline in maintaining their performance in the health care workplace. The disciplinary approach to the nursing student learning process affects increasing learning comfort, self-confidence and nurse learning outcomes.[26] Obedience and discipline must be instilled and developed with willingness and sincerity so that skills will be truly possessed and the knowledge that is being demanded and learned can be understood and mastered perfectly. Every nurse must have high professional discipline in carrying out nursing care and midwifery care and apply professional ethics in practice. The professionalism of nursing staff can be improved by fostering and enforcing professional discipline and strengthening ethical values in professional life. In the perspective of nursing, the discipline of nursing is holistic, involving nurses, the environment and patients who are interrelated depending on and need each other to protect each other.[27] With high nurse discipline, it can increase compliance with hand washing five moments six steps. The implementation of hand washing five moments six steps for every health worker in a hospital is a standard procedure in infection prevention and control that must be carried out properly and correctly. The need to increase handwashing

compliance must be done through continuous education and training aimed at increasing handwashing awareness and compliance.[28] Monitoring and evaluation by carrying out a quality audit of hand washing carried out by the hospital's control and prevention committee is the key to successful supervision and development of health workers.[29]

Implementation of hand washing significantly. The effect of nurses' intentions on the implementation of nurses' hand washing through discipline is significant with a value of VAF of 0.8043 or 80.43%. Given the provisions of the VAF value between 20% and VAF <80%, it is concluded that nurse discipline is a complete mediation variable. Meanwhile, through self-assessment, it has a VAF value of 0.22.83% or 22.8%. So it can be concluded that the self-assessment of hand washing is a partial mediation variable (partial mediation). Meanwhile, the opportunity to wash hands has a VAF value of 0.15% or 15%. So it can be concluded that the opportunity to wash hands is a variable, not a mediating variable. Based on the results, the value of the discipline VFA coefficient is the perfect mediating variable for the formation of nurses' handwashing behaviour in the application of the *Theory Of Planned Behaviour*.

This finding confirms that the formation of handwashing compliance in nurses is not based on the nurse's intention but there is a role for the discipline variable as an intervening nurse's handwashing compliance. Discipline is seen as a condition that is created and formed through the process of a series of behaviours that show the values of obedience, obedience or order. These values have become part of behaviour in life. The behaviour is created through the fostered process through family, education and experience. Based on this opinion, it can be understood that discipline is something that is integrated within a person, even discipline is something that is part of a person's life that appears in his or her daily behaviour patterns.[30]

The results of this study state that nurses who have high discipline can improve compliance with hand washing five moments six steps well to increase compliance in carrying out their duties. In addition, discipline occurs and is formed as a result and impact of a fairly long coaching process carried out from within the family and service organisations in hospitals that are oriented towards providing excellent service to patients and the community.

The findings of this study also strengthen the concept of Gordon[31], discipline is a person's ability to obey the guidelines, Standard Operating Procedures and rules that have been set by the hospital. With discipline, it can form behaviour and discipline by the rules and regulations, or behaviour obtained from training that is carried out continuously. Because to achieve compliance with nurses' hand washing five moments six steps not only requires strong intentions but also requires discipline as an intervening variable mediating the Theory Planned Behaviour application for the formation of nurse handwashing compliance behaviour. Nursing discipline is the focus and centre for the health of everyone and is a protector for people who need health and nursing services.[32]

CONCLUSION

Discipline is a perfect mediating variable in the application of the theory of planned behaviour in the compliance of nurses' hand washing five moments six steps.

ACKNOWLEGMENT

I would like to express a very high appreciation to Dr. Moh. Hafid Akbar, Sp.JP(K) as head of the military hospital Dr. Soperaoen Malang. I would also like to express special thanks to the promoter, team and colleagues from the hospital infection prevention and control committee, and I am very grateful for the assistance provided by the academic staff of the Doctoral Program at the Post Graduate School of Environmental Sciences, Brawijaya University Indonesia.

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