The Knowledge toward Complience Hand Washing Moderated by Motivation (Case Study on Hospital Nurses in Indonesia)

Halimah Tussakdiah[1], Rokiah Kusumapraja[2]

Esa Unggul University, Jakarta, Indonesia
Corresponding Author: Halimah Tussakdiah

Abstract: *Hais infection can not be separated from the role of the whole range especially nurse, so the knowledge and complience in washing hands before doing activity is a necessity, which one parameter best health service in the hospital is to control hais infection. However the problems and issues are still arising such as nurse competence about compliance in terms of washing hands before performing duties as a nurse. The purpose of this study to know influence of knowledge about nurse compliance in hand washing and to know the influence of knowledge about nurse compliance in hand washing moderated by motivation. This research was being conducted to hospital nurses using questionnaire. The method of analysis data on this research is using General Linier Model (GLM). The findings of this research are: (1) knowledge improving nurse compliance in hand washing; (2) specifically for the low motivationed nurses, a nurse with more knowledge is more dutiful to wash their hands compared with a group of the nurses who is lack of knowledge; (3) especially for group of nurses with lack knowledge, a nurse with highly motivated more obediently hand washing compared to nurse who has low motivation; (4) especially for highly motivated nurse, a group of nurses with highly knowledge more obediently hand washing compared to nurse who has lack knowledge. The implications can be given that the company can measure by other factors that can improve the compliance of handwashing nurses.*
Keyword: *knowledge, compliance hand washing, motivation, hospital, nurse*

I.   Introduction

One of parameter best health service in the hospital is to control nosocomial infection. The high number of hais infection be an important problem at the hospital, if the condition of patient is worsen so the treatment will become longer, those things will cause great losses to patients and their family because the longer patients are treated will increase the expense. Hais infections are influenced by many factors (multifactorial). Both factors that are in the body patients have, and factors that are around them. There are other factors that can affect the hais infection, which is intrinsic factor that includes age, gender, and a factor which includes the length of treatment, decline in treatment standard and the large number of patients, general condition, the risk of therapy, the presence of other disease as well as mikroba pathogen also contributes to an onset hais infection in a hospital.

Aside from that factor there also another factor that came from the outside (extrinsic factor) which is medical services officer, medical equipment, environment, food and drink, other patients and visitors. Another factor from outside that is disobedience of nurses to perform nursing, nurses not doing hand washing with right before and after the act of nursing. The compliance level of health workers in maintaining himself through the effort to clean up their hand is still low, so we need to constantly supporting the cleanse hand campaign. For that the capacity of health workers especially nursing needs to be improving knowledge about the impact and a result of compliance washings hand.

Washing the hands with soap is one of the acts of sanitary by cleaning fingers using water and soap by humans to be clean and break the chain. Wash the hands with soap also known with one of the prevention of disease. This is done because the hand is often become the agent that carries the germ and cause phatogen to move from one person to person another. The research on hand hygiene which was done in 2006 by hartanti mentioned the standard protocol, Providing of hand washing facilities, Activity counseling and evaluation performance can boost compliance cleanliness hand in the department of an internal disease increased from 46% to 77%. In hospital officers/nurses hand washing habit is the most important action once in effort to prevent and control hais infection (Schaffer, 2000). This is due to a hospital was a storehouse of microba pathogen (Darmadi, 2008). The majority of infection can be prevented with effective strategy by hand washing (Berman, Snyder, Kozier dan Erb, 2009). One strategy has been proven useful in control of health workers in control nosocomial infections is increasing the ability and knowledge of health workers in pretending to clean in nursing work.

In the research Khawaldeh, Hussami dan Darawad (2015) stated, for the purpose of digging knowledge, trust, attitudes and compliance selfreport. As for the problem to which the phenomena of in this research compliance practices washing the hands nursing students. Objects and those selected by writers was the nursing, this is considered to be important because students nursing will produce a nurse who had quality, so knowledge of compliance washing the hands implanted as early as possible in the world of nursing. Education world is a place by which a person can dig the knowledge and learn to develop and reflect positive, creative and innovative before the man to come in the world of a job or a career. Nursing education is one container producing a reliable nurses and able to be the help maintain public health in the hospital environment. In research which took on a theme of a problem compliance washing the hands. The hospital is still the ideal place to be the research location, It is clear there are still many studies that have gone before and many of them made the hospital as the research location.

Maher, Eslami dan Mohammadzadeh (2016) Awareness of correct washing hands will drive them to obey hand hygiene and knowledge. Attitude is a major factor in the quality of health. The same thing are also stated in Suchitra and Devi (2007) research, that knowledge and attitude is most important things in washing the hands that must be owned by all health workers aims to order to reduce the spread of infection nosocomial in the hospital.

In the research Pratama, Koeswo dan Rokhmad (2015); Saragih and Rumapea (2011) Discussed the issue of factors and characteristic of compliance washing the hands, both of the research was using the method of observation by studying directly about variables factors and characteristics can affect the compliance of washing the hands. Factors and characteristic that affecting compliance washing the hands produced by some respects including knowledge, facility, role model, education, age and how long working on that research location.

Islamic Hospital Cempaka Putih Jakarta is currently revitalizing hand washing on health workers especially nurse as an effort to prevent hais infections. Health workers especially nurse is one of worker in hospitals which directly interact with patients and a source of cause of the nosocomial infections. Facilities as well as posters about steps to do washing hands are already available in all rooms, however efforts by islamic hospital Jakarta in the reduction of the hais infections is not separated from the role of the whole of his staff particularly nurse, So that knowledge and compliance in washing their hands before they do the acivity are a must.

In implementing the practice of cleaning hand, Islamic Hospital Jakarta already has a procedure implementation it was in line with standard Word Health Organization (WHO) that is: (1) washing hands before being in contact with a patient; (2) Implement washing hands before take action of asepsis, (3) Implement hand washing after the nurse hands touched by a liquid from patient body; (4) Implement hand washing after contact with a patient; (5) Implement hand washing after contact with the environment about outdoor patients. Islamic Hospital Jakarta Cempaka Putih in addition to set standards the implementation of washing hands, the hospital is also provide counseling and socialization on the steps to always washing hands with using alcohol handrub in each corner of the room the hospital.

Islamic Hospital Jakarta Cempaka Putih in monitoring to implementation of hand hygine also provide the analisys and interpretation with the result: in 2015 the number of incident rate IDO is 0,95%, while in 2016 the number of incident IDO is 0,28%, means decreased by 0,67% and at the number of incident rate Flebitis in 2015 is 0,28% while in 2016 is 0,15% it means decreased by 0,13%. For that an audit and education compliance do cleanliness hands should be washed with ADP also implementation SPO pre and intra operation related officer need to be implemented and evaluated with continously.

Based on exposure background mentioned, So the purpose on this research that is, to let us know the influence of knowledge about compliance washing hands moderated by motivation nurses in Islamic Hospitals Cempaka Putih in Jakarta, Indonesia.

II. Literature Study
Compliance in hand washing

Compliance in general is defined as a behavior level of someone who get medical treatment, Following diet and lifestyle or implemented in accordance with recommendations health service providers (WHO, 2009). While according to Perry dan Potter (2006) the understanding of washing hand that is the basic technique which is the most important in the prevention and infection control. Compliance hand washing nurses is docility nurse to practices hand washing habits in accordance with standard operating procedures (SOP) or procedure to the act of universal prevention (*universal precaution*) As an effort to for the prevention of the occurrence of the transmission of a disease from patients to of a health professional and on the other hand (Kuncoro, 2012). Compliance hand washing can be measured by using the theory from WHO (2009).

Knowledge

Knowledge about washing the hand is nurse understanding or ability in the practices washing the hands which is obtained after studies and practices ways washing the hands set in accordance with the procedures, According to a certain way and in particular situation (Kuncoro, 2012). While according to Notoatmodjo (2010) Knowledge is a result of what has been known to be, and that was after having people to do certain sensing toward an object. Sensing there has been through human senses, namely the sense of vision, hearing, smelling, taste and touch. According to WHO Guidelines on Hand Hygiene in Health Care, Variables reaches as high as the level of knowledge of the nurse who often says to make a statement on the hand hygiene compliance that deals with the level of knowledge of the nurse who often says about washing the hands both before and after picking up his the act of nursing.

Motivation

According to Nasution (2011) nurses motivation in hand washing is something urge that raises a nurse to adhere to practice or Habits washing the hands according to standard operating procedure (SOP). Motivation is a kind of a burden to attain a desired goal and results of the motivation can be done in his behavior (Pieter dan Lubis, 2011). Nurses motivation can be measured by theory from McClelland (1987), which consist: (1) need for achievement, Was the reaching success, as measured according to a standard of perfection within one person; (2) need for affiliation, Is the need for warmth and indorsement in connection with other; (3) need for power, The need to control and affect for others. This need, led the affected person not or less care much about the feelings of others.

HYPOTHESIS

Compliance nurse in perform the fixed procedure of act in nursing, including in hand washing procedure, Became one of a determining factor of the success of the prevention of disease especially a disease of nosocomial infections. Increasing levels of compliance washing the hands done by nurses in Islamic Hospitals Jakarta Cempaka Putih can not be separated from the level of knowledge possessed by the nurse in the hospital. Someone knowledge formed through the senses especially the sense of vision and hearing about various things or in the life of everyday, and forming an act or habit in hand washing. The level of knowledge can affect compliance washing the hands, the higher the level of knowledge a nurse the higher ability to obey procedure compliance wash their hands through intellectual ability to increase, interpersonal, and technical skills. In the earliest research Widyanita dan Listiowati (2014) Stated that there were a significant relation between the level of knowledge by compliance the *hand hygiene* among education programs profession of a doctor. Suchitra and Devi (2007), Ekwere and Okafor (2013), Khawaldeh, *et al*. (2015), Pratama, *et al.* (2015) and Maher, *et al*. (2016) Also stated knowledge having the effect on compliance of washing hands. Of several previous researchs can look that, knowledge is essentials and significantly to hand washing compliance. Based on literature above hypothesis that may be put forward:
H_1: Nurses knowledge boost compliance of washing hands.

The activity of washing hands in a hospital was the most important things in the execution of a task nursing, Hence the hospital has to develop innovations within developing their activities in financing awareness of the importance of a nurse in washing the hands. The success of nurse in both developed a conscience hand washing supported by several of factors such as knowledge. Knowledge factors can be obtained from inside the company or hospitals and in gathered from outside of hospitals, as formal and informal level of education. Research from Pratama*, et al*. (2015) stated, there should be other factors to support the high level of hand hygiene in its implementation namely knowledge factors. This imposed that community knowledge really matter in determining the high level of hand hygiene is the inner self of a nurse. In this research, we tried to provide motivation factor as a moderation factor between knowledge and compliance washing the hands. As in previous research Ekwere and Okafor (2013) factors that can increase *hand hygiene* besides knowledge factors exist in being is a motivation factor. Of literature above, so hypothesis that may be put forward which is: H_{2a}: Specifically for the nurses with low motivation, nurse with high knowledge more obedient washing hands than a nurse group with low knowledge. H_{2b}: Specifically for the nurses with low knowledge, A nurse with highly motivated more obedient hand washing compared with nurse who has low motivation. H_{2c}: Specifically for the highly motivated nurses, A nurse with high knowledge more obedient hand washing compared with nurse who has low knowledge.
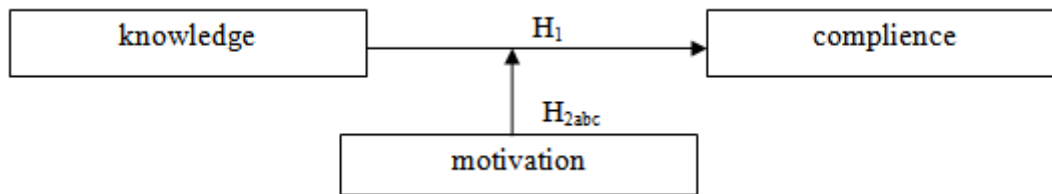From the description above research model can be described as follows:

Figure 1
Research Model

Research Method

The study is done at Cempaka Putih Islamic Hospital in the area of Jakarta, Indonesia. The aspects that are knowledge analyzed in terms of the hand washing, the compliance washing hands and motivation. The research was done in June 2017 with a method of surveying. This research is descriptive. The data collection was done with spreading the questionnaire to the nurses in Cempaka Putih Islamic Hospital in Jakarta, Indonesia. The method of analysis data on this research using non hierarchical statistics; Processed with software statistics data GLM (General Linear Model). According to Agung (2006) Sample size used is the sum total of the average cells multiplied 30 (minimum), where the number of cells are four (Table 1) so that 4 x 30 = 120 respondents, with two variables that is variable which is divided into high knowledge and low knowledge. Variable motivation that is divided into motivation high and low motivation. Classifications knowledge done with determine the value of the median split, A score of above median split are knowledge high and the values below median split are low knowledge with the motivation classification do to determine value split median, a score of above the median split is considered to be higher and the values below the median split which have a relatively low. The data that has been collected in and later be the measurement of a likert scale on a scale one to five. The results of the analysis then interpreted and the last step inferred and given feedback.

Table 1 The Number Of Median Split

		Value Label	N
Knowledge	1.00	High	60
	2.00	Low	60
Motivation	1.00	High	60
	2.00	Low	60

Source: Test on data analysis

Measurement

In research are a independent variable that is knowledge of washing hands, dependent variable that is compliance while the role of motivation variable as a moderation variable which can affects independent variable and dependent variable. The measurement of knowledge hand washing use the theory from WHO (2009) adopted by Ardana (2016) which consist of twentieth question, variable compliance is adopted from Ardana (2016) which adapted from WHO (2009) consisting of fifteen to questions and variable motivation use a theory from McClelland (1987) consisting of twenty nine questions, Then tested the validity and reliability. This research is using confirmatory analysis factor in order to test validity and the value of sampling Kaiser-Meyer-Olkin (KMO) And measures sampling sufficiency (MSA). In this research, the obtained value must be greater than 0.500 which mean that factors the analysis true or appropriate for use, and process can be continued (Malhotra, 2012). Hand washing knowledge scale consisting of 20 questions, scale of compliance consist of 15, motivation scale consisting of 29 questions and invalid to MK2, MK6, MK7, MK8, MK10, MK11 and MK12 Because obtained the value of KMO < 0.500 and have more than one matrix components so that it cannot be put in the questionnaire this research. Reability test with the value of Alpha Cronbach > 0,5 which mean reliable (Sekaran, 2011), So that it can be said the questions of all the variables it can be said trusted as a means of data collection during research.

III. Results

In this research, as can be seen in Table 2 where the hypothesis 1 using the F statistics on the line 'knowledge and nurse complience' where $F_0 = 19.578$ (Sig. 0.000) with free degrees in the amount of 1/116. This indicates a rejection of H_0, so that it can be conclude that the data support a hypothesis which has to submit the proposal. This showed that compliance nurses influenced by knowledge nurse in washing the hands. The higher knowledge level of nurses can improve compliance in the Islamic Hospital Cempaka Putih in Jakarta, Indonesia.

Hypothesis 2, the value of that will be tested to see the differences in the gaps of average of nurses compliance (Y) which is formed by knowledge (P) high (P=1), low knowledge (P=2) both at high motivation nurses (M=1) as well as with low motivation nurses (M=2) After taking into account the influence of linear knowledge (x) of compliance nurses (y) similar in all cells. The results of analysis support hyphotesis H2a specifically for the nurses low motivation, a nurse with high knowledge more obedient to hand washing than nurse with low knowledge (β1) with value sig. 0.000 (<0.05).

On the outcome of the hypothesis 2b, Found the results of the analysis that supports a hypothesis that is special for the a nurse with low knowledge, A nurse with highly motivated will be in hand washing compared with nurse who has motivation low (β2) with value sig. 0.000 (<0,05). On the outcome of the hypothesis 2c, the results found not supporting the hypothesis H2c which is special for the nurse highly motivated, a group of high knowledge nurses is not more obedient in washing hands compared to a group of nurses with low knowledge (β3) with value sig. 0.126 (>0,05).

Table 2: Test of Between-Subject Effects

Dependent Variable: Nurse complience

Source	df	F	Sig
Corrected Model	3	14.546	0.000
Intercept	1	3991.558	0.000
PMEDIAN	1	19.578	0.000
MMEDIAN	1	16.201	0.000
PMEDIAN*MMEDIAN	1	2.379	0.126
Error	116		
Total	120		
Corrected Total	119		

Source: Test on data analysis

Tabel 3: The Testing Of Hypothesis Model Research

Hipothesis	Statement hypothesis	Value *Sig*.	Explanation
H₁	Knowledge improving nurse compliance in washing hands.	0.000	Data support the hypothesis
H₂ₐ	Specifically for the nurse motivation low, a nurses with high knowledge more complience in hand washing than the nurses with low knowledge.	0.000	Data support the hypothesis
H₂ᵦ	Specifically for the nurses with low knowledge, a nurse with highly motivated will more compliance hand washing compared to nurse who has motivation low.	0.000	Data support the hypothesis
H₂ᵥ	Especially for the nurse with high motivation, the nurse with high knowledge not more obedient hand washing compared with the nurses with low knowledge.	0.126	Data not support the hypothesis

IV. Discussion

The results of testing the hypothesis 1, found that the results of the analysis supported hypothesis H1, which is knowledge improve compliance hands washing by nurse. The result of this research strengthens the results research formerly practiced by Khawaldeh, et al. (2015) stating that knowledge and attitude to increase compliance with hand washing practice among nursing students, Which means that is with good and quite of knowledge can affect an increase in compliance washing hands to their nursing students. In line with the results of the hypothesis above, Suchitra and Devi (2007); Saragih and Rumapea (2011); Widyanita and Listiowati (2014) also said knowledge of its effect on compliance of nurse hand washing.

The results of hypothesis 2a, found that the results of the analysis support a hypothesis H2a which especially for group of low motivation nurse, a nurse with high knowledge more obedient in hand washing than group of nurse low knowledge (β1). The result of this research strengthen the results research conducted by Khawaldeh, et al. (2015) that compliance washing hands influenced strong by a factor of knowledge, belief, and someone attitude. In line with this hypothesis researchers Maher, et al. (2016) said the influence of education of hand hygiene has very significant impact on knowledge and attitude.

The results of hypothesis 2b, found that the results of the analysis support a hypothesis H2b which especially for group of low knowledge, A nurse with high motivation more obedient in hand washing than group of nurse low motivation (β2). The result of this research strengthen the results research conducted by Ekwere dan Okafor (2013) who said that knowledge having the effect on compliance washing the hands, In addition the main motivations for wash their hands are scared of contracting diseases. As well as Saragih, et al, (2011) say it is for supporting groups of low knowledge to can improve compliance washing the hands influenced by characteristic community knowledge are each nurses in hospitals.

The results of hypothesis 2c, found that the analysis does not support hypothesis H2c which especially for group of high motivation nurse, a group of nurse with high knowledge not more obedient washing hands compared with group of a nurse with low knowledge (β3). This hypothesis were not in line with opinion of Suchitra and Devi (2007) stating that education has a positive impact on the retention of knowledge and attitude. This hypothesis also were not in line with Ekwere and Okafor (2013), stating compliance wash their hands beside influenced by knowledge also affected by motivation, A motivation that described in this research is motivation to not contracting diseases caused by the patients. Based on the results of this research group hypothesis of a nurse with high motivation, A group of nurses with high knowledge more obedient of a group of low knowledge, to an Islamic Hospital Cempaka Putih is not proved, this imposed that nurses as sample (inspected) in implement to carry out hand washing (*hand higene*) More tends in improving the motivation in this case the motivation achievement, motivation affiliation and motivation power with reliable results. So it is with knowledge, the level of nurse knowledge at Islamic Hospital Cempaka Putih Jakarta, obtained from unsustainable seminars, This seminar held when they give extend hospital permit which involved all nurses and also training held for new nurses.

V. Managerial Implications

This study discusses handwashing knowledge of hand washing compliance moderated by motivation of nurses at a hospital in Jakarta, Indonesia. The implications of managerial that can be suggesting perform the recruitment and selection of competent and qualified nurses. One way in search of good quality human resource is through nurse recruitment. The second implication is to cultivate a culture washing hands on everyone who connected with a patient, not only nurses but also doctor, administration staff and visitors. Culture are a values which have become guidelines human resources to deal with external problems and an effort to integrated adjustment into the company, so that each of members of an organization must understand values that is and how they had to act and behaving. Hospitals can implement education and developing human resources through training, seminar, and *workshop* or other kind of activities. The purpose of this human resource development is to improve the quality of professionalism and skill in nurses in carrying out tasks and functions as a nurse.

VI. Conclusions

The results that can be concluded from this research are: First, the first hypothesis shows that the knowledge of the nurse influences handwashing compliance. The high knowledge of a nurse, it will also affect the high awareness of the nurse to be obedient to hand washing/hand hygine (hypothesis supporting). Second, on the hypothesis H2c indicated especially for a group of nurse with low motivation, nurses with higher knowledge more obedient with hand washing than low knowledge nurses (hypothesis supported). It can be said that high knowledge will be more obedient in hand washing than the low knowledge nurses. Third, hypothesis H2c indicated specifically for a group of nurses with low knowledge, Highly motivated nurses are more obedient to handwashing than low-motivated nurses (hypothesis supported). For the medical world especially nursing, high motivation is needed and becomes the main thing for a nurse to consciously and obediently to wash hands. Islamic Hospital Cempaka Putih were more satisfied with a nurse with highly motivated. Fourth, hypothesis H2c indicated especially for high motivation group, a group of high knowledge nurses were more dutiful than the low knowledge nurses (hypothesis is not supported), because of the compliance domain of hand washing, the nurse's attention to the knowledge of the respondent at Islamic Hospital Cempaka Putih Jakarta, both high-knowledge nurses and low-knowledge groups alike desire to get good motivation from Islamic Hospital Campaka Putih Jakarta.

Limitations of Research

Limitations of this study may be considered for further research. This study uses questionnaires as a measuring tool for the purpose of saving time and energy. However, questionnaires have limitations such as bias in filling in questions. There is a possibility that the respondents did not answer the questionnaire in real or just fill out the questionnaire answers based on the ideal conditions expected and not the actual conditions that are happening. In addition, the limited number of samples and variables can also affect the knowledge of nurses on handwashing complience moderated by motivation, as well as the amount of analysis that causes the researcher can not dig deeper about other factors that affect handwashing compliance.

Suggestion for Further Research

Suggestion for further research that is suggested can add other variables that can influence handwashing compliance such as facility and infrastructure variable. Further research is also expected to be performed on other research objects such as general objects such as terminals, Train station, airport or companies that demand high hygienes such as pharmaceutical companies and restaurants to obtain more objective and representative results with greater coverage.

Reference

[1]. Agung, I.G.N. 2006. *Statistika: Penerapan Model Rerata-Sel Multivariat dan Model Ekonometri dengan SPSS*. Jakarta: Yayasan SAD Satria Bhakti.
[2]. Ardana, I.G.A.G.O. 2016. *Program Penyadaran Kepatuhan Cuci Tangan Dapat Meningkatkan Pengetahuan Cuci Tangan, Menurunkan Jumlah Koloni Bakteri Staphylococcus Aureus pada Tangan.* Tesis Universitas Udayana. Denpasar.
[3]. Berman, A., Snyder, S., Kozier, B., and Erb, G. 2009. *Buku Ajar Praktik Keperawatan Klinis Kozier dan Erb*. Jakarta: EGC.
[4]. Darmadi. 2008. Infeksi *Nosokomial: Problematika Dan Pengendaliannya.* Jakarta: Penerbit Salemba Medika.
[5]. Ekwere, T.A., and Okafor, I.P. 2013. Hand Hygiene Knowledge and Practices Among Healthcare Providers in a Tertiary Hospital, South West Nigeria. *International Journal of Infection Control.* Vo. 9.
[6]. Khawaldeh, O.A., Hussami, M., and Darawad, M. 2015. Influence of Nursing Students Handwashing Knowledge, Beliefs, and Attitudes on Their Handwashing Compliance. *Scientific Research Publishing*.
[7]. Kuncoro. 2012. *Kesehatan Reproduksi untuk Mahasiswa Kebidanan dan Keperawatan*. Jakarta: Salemba Medika.
[8]. Maher, A., Eslami, Z., and Mohammadzadeh, K.L. 2016. Effect of Hand Hygiene Education on Knowledge, Attitude and Practice of NICU and Pediatric Staff in Zanjan Hospitals. *International Academic Journal of Organizational Behavior and Human Resource Management.* Vol. 3, No. 2, pp. 35-43.
[9]. Malhotra, N.K., Birks, D.F., and Wills, P. 2012. *Marketing Research: an applied approach*, 4th edition. Harlow: Pearson education, inc.
[10]. McClelland, D.C. 1987. *Human Motivation*. New York: Cambridge University Press.
[11]. Nasution. S. 2011. *Berbagai Pendekatan Dalam Proses Belajar Mengajar*. Jakarta: PT BumiAksara.
[12]. Notoatmodjo, S. 2010. *Ilmu Perilaku Kesehatan*. Jakarta: PT Rineka Cipta.
[13]. Perry, A.G., and Potter, P.A. 2006. Buku Ajar Fundamental Keperawatan: Konsep, Proses dan Praktek. Edisi 4. Jakarta: EGC.
[14]. Pieter, H.Z., dan Lubis, N.L. 2011. *Pengantar Psikologi untuk Kebidanan*. Jakarta: kencana.
[15]. Pratama, B.S., Koeswo, M., and Rokhmad, K. 2015. Determinant Factors of ER Nurses' Hand Hygiene Compliance at dr. Iskak Hospital Tulungagung. *Jurnal Kedokteran Brawijaya.* Vol. 28, Suplemen No. 2.
[16]. Saragih, R., dan Rumapea, N. 2011. Hubungan Karakteristik Perawat Dengan Tingkat Kepatuhan Perawat Melakukan Cuci Tangan di Rumah Sakit Columbia Asia Medan. *Jurnal Ilmu Keperawatan*. Volume 3, No. 1.
[17]. Schaffer, S.G. 2000. P*encegahan Infeksi dan Praktek yang Aman*. Jakarta: EGC.
[18]. Sekaran, U. 2011. *Metodologi Penelitian untuk Bisnis*. Edisi 4. Jakarta: Salemba Empat.
[19]. Suchitra, J.B., and Devi, N.L. 2007. Impact of Education on Knowledge, Attitudes and Practices Among Various Categories of Health Care Workers on Nosocomial Infections. *Indian Journal of Medical Microbiology*. Vol 25.
[20]. WHO. 2009. *WHO Guidelines on Hand Hygiene in Health Care*. Switzerland: WHO Press, World Health Organization.
[21]. Widyanita, A., dan Listiowati, E. 2014. Hubungan Tingkat Pengetahuan *Hand Hygiene* Dengan Kepatuhan Pelaksanaan *Hand Hygiene* pada Peserta Program Pendidikan Profesi Dokter. *Biomedika.* Volume 6 Nomor 1.