The Compliance of Hospital Nurse in the Prevention of Urinary Tract Infection in Surabaya, Indonesia

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ABSTRACT

Background: Catheter-Associated Urinary Tract Infection (CAUTI) is one of the most common infections in the hospital. In order to prevent and control CAUTI incidence, nurses are required to implement bundles of prevention. However, the lack of nurses' compliance behavior in implementing the CAUTI bundle prevention was found. Objective: This study analyzes the nurse's compliance behavior in implementing CAUTI prevention using the Theory of Planned Behavior (TPB) approach. Methods: This study was an analytical descriptive study with a cross-sectional design. Nurses who work in ICU, ICCU, HCU, and in-patient unit of the hospital were set as study population and taken as samples using simple random sampling. Background factors (age, education, knowledge, employment duration, career levels), attitudes, subjective norms, Perceived Behavior Control (PBC), and intention were determined as independent variables. In contrast, nurses' compliance behavior in CAUTI prevention bundle implementation was determined as the dependent variable. Data were collected using a questionnaire and analyzed using logistic regression with a significance level of a < 0.05. Results: Among 111 nurses, most of them are in the age of 26-45 years (80.1%), has worked as a nurse for 8-13 years (29.7%), reach career level at Clinical Nurse 3 (51.4%), and have good knowledge about CAUTI prevention bundle (83.8%). The employment duration and career levels are background factors that correlate the most to the TPB factors. The nurses' compliance behavior is influenced by attitude, subjective norm, PBC, and intention (P Value= 0.000). Multivariate analysis shows that intention is associated with nurses' compliance behavior and increases nurses' commitment to implement CAUTI prevention bundle (P Value= 0.033, OR= 6.46). Conclusion: The intention simultaneously influences the nurses' compliance behavior.

Keyword: Compliance behavior, bundle of prevention, urinary tract infection.

INTRODUCTION

Nosocomial infection, or currently commonly referred to Healthcare-Associated Infections (HAIs), can be defined as infections obtained during contact and activity in health facilities. The infection is not due to the patient's disease and is not present or incubated when the patient enters the health facility. Clinical manifestations of HAIs may also appear in patients who have returned home after treatment from health workers due to their mobilizations in the area of health facilities (Haque *et al*., 2018). The prevalence of HAIs varies depending on technological advances and health policies in each region. Developed countries generally have a prevalence of HAIs between 3.5% to 12%, while in developing countries, the prevalence reaches between 5.7% and 19.1% (WHO, 2010).

Urinary tract infections due to catheters or CAUTI (Catheter-Associated Urinary Tract Infection) are among the most common types of HAIs, which reach up to 40% of all HAIs. CAUTI occurs due to the installation of a urinary tract catheter (Kausuhe *et al*., 2017). Catheter-attached patients have bacteriuria that increases with catheterization duration; the daily risk rate reaches 5%. Within four weeks, almost 100% of patients who installed the catheter can contain bacteriuria in their urine. One to four percent of patients with bacteriuria will experience

clinically significant infections, for example, cysts, *pyelonephritis*, and septicemia (WHO, 2018).

CAUTI can lead to complications and an increased burden of the underlying disease. It causes other adverse domino effects such as declining health care quality due to patients' discomfort, increased time of stay, and treatment costs in health facilities. It is one of the causes of approximately 13,000 hospital deaths per year (CDC, 2020). Studies conducted in both adult and children's ICU showed an increase in hospitalization duration caused by CAUTI by 19.2 days, while mortality due to CAUTI increased by 11.1% (Al-Mousa *et al.*, 2016).

CAUTI events can be prevented and controlled by regular regulation of efficient, aseptic, and sterile catheter installation and use. Compliance in performing catheter care and regulation also contributes to the preventive efforts of CAUTI (CDC, 2010). The prevention and control efforts are organized in a preventive bundle. This bundle contains a series of interventions and efforts to reduce CAUTI events. The prevention bundle acts as a barrier nursing (nursing care) that documents evidence of catheter regulation and care (Sari and Satyabakti, 2015). The implementation of good catheter care guidelines in this bundle can reduce the risk of CAUTI because both are related (Perdana *et al.*, 2017) and reduce the risk by 9.3% (Fritsch *et al.*, 2019).

Nurse compliance to perform aseptic catheter care plays an essential role in CAUTI prevention efforts (Anggi *et al.*, 2019). The reality is that nurses are still less compliant to implement the points in the prevention bundle. The factors that affect nurse compliance in implementing this prevention bundle have not been widely explained in previous studies. Information on nurse compliance implementing CAUTI prevention bundles is still limited and has not explained nurse compliance's motives and initiatives in detail (Fritsch *et al.*, 2019).

This study analyzes nurses' compliance in implementing CAUTI prevention bundles through the Theory of Planned Behavior (TPB) approach. TPB explores the relationship between behavior and beliefs, attitudes, perceived behavior control (PBC) or behavioral control, and intentions (NIH, 2012). The intention is based on nurses' behavior in performing nursing care, especially CAUTI prevention bundles, to provide appropriate intervention and plan to improve patients' services.

METHODS

This study is a descriptive-analytical study that uses a cross-sectional study design based on the Theory of Planned Behavior (TPB). This study analyzed individual backgrounds consisting of age, education level, knowledge, career level, and TPB components, including attitudes, subjective norms, behavioral control, and intentions. It linked TPB factors to compliance behaviors of CAUTI prevention bundle implementation.

This research is based on primary data obtained through interviews using questionnaires with hospital nurses as respondents. The interview questionnaire is a combined questionnaire between personal data to determine the background characteristics (age, education, knowledge, employment duration, career level) of respondents and TPB measurement instruments to measure attitudes, beliefs, subjective norms, and nurses' behavior control.

The number of research samples is calculated using Slovin's sample formula, which is a formula to determine the minimum sample that represents a large population:

$$n = \frac{N}{1 + N(\alpha)^2}$$

The population (N) of 136 people, with an error value (α) of 0.05, so the minimum sample (n) is 100.4, rounded up to 101 people. The number of samples was then increased by 10% to anticipate the dropped out respondents so that the total sample is 111 nurses.

Samples are recruited using the simple random sampling technique. The respondent criteria set out in this study are permanent nurses who have received essential Infection Prevention and Control (PPI) education and training and CAUTI Prevention Bundle Quality Clinic Training. Bivariate data analysis uses the Spearman correlation test and Chi-Square test, and the logistics regression test is used for multivariate analysis. This research has

been approved by the Health Research Ethics Committee of the Nursing Faculty, Universitas Airlangga.

RESULTS AND DISCUSSION

Characteristics of Respondents

One hundred and eleven nurses participated in the study. Characteristics of nurse's backgrounds can be observed in Table 1. Table 1 shows that most respondents are in the group age of 31-45 years old (62.2%). A person generally reaches the peak of productivity at the age of 30-40 years (Institute of Medicine (US) Committee on the Long-Run Macroeconomic Effects of the Aging US Population, 2012), which is why many health workers are in this age range. Most respondents had a vocational nursing education background or D3 (73%).

Table 1. Characteristics of the Respondent's Background

Characteristics	n	%
Age		
20-30 years old	35	31.5
31-45 years old	69	62.2
≥46	7	6.3
Education		
D3 Nursing	81	73.0
D4 Nursing	2	1.8
S1 Nursing	28	25.2
Employment Duration		
1-7 years	37	33.3
8-20 years	57	51.4
≥20 years	17	15.3
Career Level		
Clinical Nurse 1 (PK 1)	24	21.6
Clinical Nurse 2 (PK 2)	30	27.0
Clinical Nurse 3 (PK 3)	57	51.4
Knowledge		
Insufficient	0	0
Sufficient	18	16.2
Good	93	83.8
Total	**111**	**100.0**

Table 1 also shows the respondent's career background as a nurse. Most respondents have worked in the hospital for eight to twenty years (51.4%), with the majority of career levels already at the level of Clinical Nurse 3 (PK 3) (51.4%). The majority of respondents have a good level of CAUTI prevention bundle knowledge (83.8%). This knowledge level is measured by questions regarding nursing, pathogenesis, symptoms, and enforcement of CAUTI diagnosis. The respondents' criteria have met the minimum criteria of nurses for Infection Prevention and Control (PPI) in hospitals (Kemenkes RI, 2017).

Theory of Planned Behavior (TPB) Component in CAUTI Prevention Bundle Implementation

Theory of Reasoned Action (TRA) developed into Theory of Planned Behavior (TPB) and was initiated in 1985. The behavior-forming component in TPB consists of attitudes, subjective norms, behavioral controls, and intentions. Intention becomes the main factor of TPB that gathers motivation that influences individuals to perform certain behaviors. The intention is an indication of how much a person attempts to engage in a behavior. Strong intentions produce an outstanding performance as well. The intention is supported by factors of individual subjective attitudes and norms towards the behavior. Behavior control is a new element in TPB that distinguishes it from TRA. Intention itself can predict behavior if individual controls are moderating the same behavior in each individual. In fact, behavior control varies in each individual, therefore to predict the implementation of a behavior, intentions and behavioral controls must interact with each other in order for a person to be motivated to try (Ajzen, 2012).

The distribution of respondents based on TPB components in implementing the CAUTI prevention bundle can be observed in Table 2. Table 2 shows a positive attitude towards implementing the CAUTI prevention bundle (65.8%). Attitudes in the nursing world are related to how a nurse understands problems and determines essential and relevant matters (Price, 2015). Attitude factors were measured through the objectives, functions, and benefits of implementing the CAUTI prevention bundle for respondents. Some respondents have negative attitudes towards the implementation of the CAUTI bundle. This condition occurs because the respondents did not fully understand the purpose, function, and benefits of implementing the CAUTI prevention bundle to improve nursing quality and reduce the incidence of HAIs from the CAUTI type. This condition is because actions considered to be the respondent's priority (nurse) to be carried out and documented are curative and rehabilitative actions related to the patient's vital status.

Table 2 shows a good subjective norm (68.5%). These subjective norms are influenced by those around the individual's normative beliefs and motivations (Kan *et al.*, 2017). Some respondents have unfavorable subjective norms due to the people's unsupportive demands and the surrounding environment, such as the head of the room, which only checks during a debriefing at the beginning of changing shifts and the absence of policies regarding rewards and punishments in implementing the CAUTI prevention bundle. In this study, the respondents with poor subjective norms were usually nurses with a heavy workload, such as an ICU nurse.

Table 2. The Theory of Planned Behavior (TPB) in the implementation of CAUTI Prevention Bundle

Characteristics of Factors in TPB	n	%
Attitude		
Positive	73	65.8
Negative	38	34.2
Subjective Norm		
Good	76	68.5
Insufficient	35	31.5
Behavior Control		
Good	50	45.0
Insufficient	61	55.0
Intention		
Strong	86	77.5
Weak	25	22.5
Behavior		
Good	65	58.6
Insufficient	46	41.4
Total	**111**	**100.0**

The majority of respondents (55%) still showed poor behavior control. Ease of access to work facilities and environment, work management, information, barriers, and work stressors become behavioral controls that affect nurses' performance and compliance in carrying out their duties (Zúñiga *et al.*, 2015). Respondents who showed reasonable behavior control were still few because there were still many nurses who felt that there were many obstacles in implementing the CAUTI prevention bundle, for example, constraints in time and workload that were felt to be heavy. Respondents also experienced difficulties accessing facilities and information at the hospital where they worked, for example, the limited number of measuring cups for patients' urine collection. The measuring cups for urine collection should be separated for each patient to prevent bacterial contamination cannot be fulfilled. The difficulty accessing information felt by respondents was that knowledge about infection prevention and control (PPI) was only given once during career advancement certification.

Most of the respondents had a strong intention to implement the CAUTI prevention bundle (77.5%). The intention is measured by the respondent's desire to implement the CAUTI prevention bundle in several situations, i.e., in ordinary situations, situations with rewards, and the application of routine supervision. The existence of supervision and rewards is one of the organizational cultures, where this organizational culture can increase performance and job satisfaction by creating a good quality of work-life (Winasih *et al.*, 2015). The results showed that the respondents desire to implement the CAUTI prevention bundle, especially if rewards bring job satisfaction.

The majority of respondents behaved well in implementing the CAUTI prevention bundle (58.6%). Behavior is measured by observing respondents' habits when treating and monitoring patients with catheters. The results showed that most respondents compliant with implementing CAUTI prevention bundles. The group of respondents who have non-compliant behavior is due to their assumption about the incidence rate of CAUTI in the hospital where they work is relatively low (less than 2% per year). Low perception of infection risk tends to cause non-compliant respondents to take precautions (Haile *et al.*, 2017). In this case, the non-compliance behavior occurs because the respondent assesses CAUTI is not the immediate urgency.

Nurse Background Relationship with Theory of Planned Behavior (TPB)

The background of the nurses indirectly affects their intentions and behavior (NIH, 2012). The analysis using the Spearman Correlation test was conducted to determine the background relationship with TPB components in the implementation of the CAUTI prevention bundle. The respondents' background relationship with TPB behavior-forming components in implementing the CAUTI prevention bundle is presented in Table 3.

Table 3. Relationship between Nurse Background and TPB Behavior Component in CAUTI Prevention Bundle Implementation (*statistically significant)

Characteristics	Attitude		Subjective norms		Behavior control		Intention		Behavior	
	r	p	r	p	r	p	r	p	r	p
Age	0.216	0.023*	0.089	0.350	0.184	0.054	0.232	0.014*	0.121	0.206
Education	0.264	0.005*	0.190	0.046*	0.226	0.017*	0.081	0.400	0.134	0.160
Employment duration	0.351	0.001*	0.236	0.013*	0.258	0.006*	0.270	0.004*	0.235	0.013*
Career level	0.313	0.001*	0.194	0.042*	0.261	0.006*	0.298	0.001*	0.221	0.020*
Knowledge	0.249	0.008*	0.227	0.016*	0.202	0.034*	0.289	0.002*	0.126	0.187

The correlation test of attitude factors with all background characteristics (age, education, employment duration, career level, and knowledge) shows a statistically significant P value (P Value < α = 0.05). There is a relationship between age, education, employment duration, career level, and knowledge with respondents' attitude. Strong relationships are known through the value of r. An r-value that gets closer to the value of -1 or 1 indicates an increasingly stronger relationship. The relationship between nurses' background and respondents' attitude in this study was relatively weak because the r-value only ranged from 0.2 to 0.3. The highest r value is found in the working length factor (r = 0.351). The relationship between the nurse's background and attitude is a positive correlation, meaning that the better the nurse's background, the better the respondent's attitude. Subjective norms save a significant P Value on the background of nurses other than age. There is a relationship between subjective norms and education, employment duration, career level, and respondent's knowledge. This relationship is a positive correlation that is relatively weak because the value of r only ranges from 0.08 to 0.2. The background of nurses most closely related to subjective norms is long work (r = 0.236).

Behavioral control has a significant P Value on nurses' background other than age, and it is related to education, employment duration, career level, and knowledge of respondents. This relationship is a weak positive correlation because the r-value only ranges from 0.1 to 0.2. The nurse's background most closely related to behavioral control is the career level (r = 0.261).

The intention has a significant P Value on the background of nurses in addition to education. There is a relationship between intention and age, employment duration, career level, and respondents' knowledge. This relationship is a weak positive correlation because the r-value only ranges from 0.08 to 0.2. The nurse's background is most closely related to the career level's intention (r = 0.298).

The behavior has a significant P Value on the employment duration and career level of respondents. There is a relationship between behavior with the employment duration and the career level of respondents. This relationship is a weak positive correlation because the r-value is only about 0.2. The nurse's background is most closely related to the behavior that is long work (r = 0.235).

This study showed the background of nurses who are most closely related to TPB factors is the employment duration and career level of respondents. More experience gained by nurses who have gone through a long working period as well as clinical nurses who have had higher career levels usually have a good attitude, behavior, and professionalism to provide safe, effective, and efficient nursing performance and care (Menkes RI, 2017). Nurses' duration and higher career levels are related to the rewards they receive, both intrinsic and extrinsic (Nursalam *et al.*, 2019), improving job satisfaction. Job satisfaction has a positive correlation with attitude in work, where the higher the job satisfaction of nurses, the better the attitude (Nyirenda and Mukwato, 2016). Career levels are also interconnected with subjective norms, both of which encourage each other to improve individual behavior (Balozi *et al.*, 2018). Therefore, duration and career level are the backgrounds most related to the implementation of CAUTI prevention bundles.

Influence among TPB Components in CAUTI Prevention Bundle Implementation

The influence between TPB components is presented in cross-

tabulation with intention as the main component in Table 4.

The majority of respondents who have a positive attitude have a strong intention in implementing the CAUTI prevention bundle. In contrast, the weak intentions are owned mainly by respondents who have a negative attitude. A significant P Value was shown in this study, meaning that respondents' attitudes influenced implementing CAUTI prevention bundles. This study is in line with the research results conducted by Ahsan *et al*. (2018) conducted on emergency unit nurses, mentioning that positive attitudes (confident and consequent) can affect the intention to adhere to behavior. Individual attitudes guide him to evaluate his behavior (Park & Lee, 2016).

Good subjective norms were found in respondents who also strongly intended to implement the CAUTI prevention bundle. On the contrary, the weak intention to implement the CAUTI prevention bundle is mainly owned by respondents with poor subjective norms. The results showed a significant P Value (P Value= 0.000 < α= 0.005), which means there is a subjective norm influence on a nurse's intention to carry out a CAUTI prevention bundle. This research is in line with Kusnanto *et al*. (2020) on nurse compliance to prevent pneumonia infection prevention in the ICU. Subjective norms relate to one's environmental perception, pressure, and social support for carrying out behavior (Best *et al*., 2018).

Table 4. Cross-tabulation among TPB components in CAUTI prevention bundle implementation

Category	Intention				Total		P Value
	Strong		Weak				
	n	%	n	%	n	%	
Attitude							
Positive	71	97.3	2	2.7	73	100	
Negative	15	39.5	23	60.5	38	100	0.000
Total	86	77.5	25	22.5	111	100	
Subjective norms							
Good	73	96.1	3	3.9	76	100	
Insufficient	13	37.1	22	62.9	35	100	0.000
Total	86	77.5	25	22.5	111	100	
Behavior control							
Good	49	98.0	1	2.0	50	100	
Insufficient	37	69.7	24	39.3	61	100	0.000
Total	86	77.5	25	22.5	111	100	

Active nurse participation and adequate policies of her work environment will support nurses in carrying out their duties and improving patient care quality (Jun *et al*., 2016). That means, in this case, the respondent who is a nurse has a good environment and support from the surrounding authorities so that there is a strong intention to implement the CAUTI prevention bundle.

Intentions are influenced by direct or indirect behavioral control. Behavioral control directly affects intentions through adequate information and resources, while indirectly, behavioral control affects intentions through subjective attitudes and norms formed from an individual environment (Kan *et al*., 2017).

Most respondents with control on good behavior also intend to implement the CAUTI prevention bundle strongly. However, weak intentions do not apply otherwise, only to respondents with poor behavior control. There are still respondents who intend to implement the CAUTI prevention bundle strongly. This study produced a meaningful ad, meaning that behavioral control influenced the respondent's intentions. Research conducted by Gagnon *et al*. (2015) stated that ease of access to facilities is one form of behavioral control that increases nurses' intention to make clinical prevention efforts. In addition to facilities, a safe work environment and self-efficacy also trigger a compliance nurse in carrying out nosocomial infection prevention efforts (Adiningsih *et al*., 2018). In line with this, in this study, respondents had enough information and resources to implement the CAUTI prevention bundle showing a solid intention to implement the CAUTI prevention bundle.

Effect of TPB components on compliance behavior of CAUTI prevention bundle

Table 5 shows the cross-tabulation of TPB components against nurse compliance behavior in implementing CAUTI prevention bundles.

The cross-tabulation in Table 5 shows a meaningful P Value on each TPB component, indicating that each TPB component affects the behavior of complying with the implementation of CAUTI prevention bundles. TPB factors are intertwined to produce individuals carrying out a behavior. The combination of attitudes, behavioral controls, and subjective norms forms the strength of an individual's intentions. Therefore, the appearance of intention varies depending on the situation. One or two TPB factors may significantly impact intentions and behaviors, but each factor can contribute independently (Ajzen, 2012).

Table 5. Cross-tabulation of TPB components with CAUTI prevention bundle compliant behavior

Category	Behavior				Total		P Value
	Comply		Ignore				
	n	%	n	%	n	%	
Attitude							
Positive	55	75.3	18	24.7	73	100	
Negative	10	26.3	28	73.7	38	100	0.000
Total	65	58.6	46	41.4	111	100	
Subjective norms							
Good	57	75.0	19	25.0	76	100	
Insufficient	8	22.9	27	77.1	35	100	0.000
Total	65	58.6	46	41.4	111	100	
Behavior control							
Good	40	80.0	10	20.0	50	100	
Insufficient	25	41.0	36	59.0	61	100	0.000
Total	65	58.6	46	41.4	111	100	
In.tention							
Strong	62	72.1	24	27.9	86	100	
Weak	3	12.0	22	88.0	25	100	0.000
Total	65	58.6	46	41.4	111	100	

Multivariate Analysis

The influence of the respondent's TPB's background and components on the compliant behavior of implementing the CAUTI prevention bundle was analyzed simultaneously. The results of multivariate analysis are presented in Table 6.

Multiple logistic regression tests reveal the influence of background and TPB factors on simultaneous behavior. This analysis shows only the intention as a TPB factor that significantly affects the behavior of CAUTI prevention bundle implementation (P Value = 0.33 < α = 0.05). That means intent can be a predictor of CAUTI prevention bundle implementation behavior.

The intention is the main factor that directly shapes behavior (Ajzen, 2012). The intention can influence the implementation of the CAUTI prevention bundle. Respondents with strong intentions were 6.46 times more likely to comply with the implementation of CAUTI prevention bundles than those who have weak intentions (OR = 6.46, CI = 1.16-35.86).

Table 6. The effect of nurse's background and TPB components on compliance behavior of CAUTI prevention bundle implementation

Dependent Variable	Independent Variable	P Value	OR	CI	Description
Behavior	Age	0.292	0.55	0.18-1.66	No effect
	Education	0.788	1.08	0.60-1.95	No effect
	Employment duration	0.373	1.77	0.50-6.23	No effect
	Career level	0.893	1.09	0.30-3.84	No effect
	Knowledge	0.692	0.74	0.17-3.24	No effect
	Attitude	0.595	1.43	0.38-5.40	No effect
	Subjective norm	0.199	2.33	0.63-8.55	No effect
	Behavior control	0.181	2.07	0.71-6.03	No effect
	Intention	0.033	6.46	1.16-35.86	Have effect

CONCLUSION

The intention of respondents (simultaneously) primarily influenced the compliance behavior in performing the CAUTI prevention bundle. Nurses with strong intentions were 6.46 times more compliant with the implementation of the prevention bundles. Intentions are formed from attitudes, behavioral controls, and subjective norms. These components are directly proportional so that if the components of TPB are stronger, then respondents tend to be more compliant with implementing the prevention bundle. Hospitals are suggested to create an

environment that supports nurses to improve their attitudes, behavioral controls, and subjective norms, such as the fulfillment of facilities, regular training on infection prevention and control, and improving policy regulations. It would encourage strong intention for nurses to comply with the implementation of CAUTI prevention bundles.

REFERENCES

Adiningsih, L. Y., Nopiyani, N. M. S. and Wirawan, I. M. A. (2018) 'Hospital facilities, occupational safety environment and self-efficacy as predictors of healthcare-associated infections prevention and control compliance in nurses of inpatient care units', *Public Health and Preventive Medicine Archive*, 6(2), p. 93. doi: 10.15562/phpma.v6i2.96.

Ahsan, A. *et al.* (2018) 'Analysis of Nursing Behavior Factors in Documentation of Nursing Care in Emergency Unit Using Theory of Planned Behavior', *International Journal of Indonesian National Nurses Association (IJINNA)*, 1(1), pp. 64–79. doi: 10.32944/ijinna.v1i1.20.

Ajzen, I. (2012) 'The Theory of Planned Behavior', in Van Lange, P. A. M., Kruglanski, A. W., and Higgens, E. T. (eds) *Theories of Social Psychology*. 1st edn. London: SAGE Publications Ltd, p. 583. doi: 10.4135/9781446249222.n46.

Al-Mousa, H. H. *et al.* (2016) 'Device-associated infection rates, bacterial resistance, length of stay, and mortality in Kuwait: International Nosocomial Infection Consortium findings', *American Journal of Infection Control*, 44(4), pp. 444–449. doi: 10.1016/j.ajic.2015.10.031.

Anggi, A., Wijaya, D. W. and Ramayani, O. R. (2019) 'Risk factors for catheter-associated urinary tract infection and uropathogen bacterial profile in the intensive care unit in hospitals in Medan, Indonesia', *Open Access Macedonian Journal of Medical Sciences*, 7(20), pp. 3488–3492. doi: 10.3889/oamjms.2019.684.

Balozi, M. A., Othman, S. Z. and Isa, M. F. M. (2018) 'Mediating effects of subjective norms on the relationship between career advancement and job characteristics and knowledge sharing behavior among Tanzanian healthcare professionals', *Gadjah Mada International Journal of Business*, 20(2), pp. 187–203. doi: 10.22146/gamaijb.23740.

Best, J. T. *et al.* (2018) 'The Impact of Scripted Pain Education on Patient Satisfaction in Outpatient Abdominal Surgery Patients', *Journal of Perianesthesia Nursing*, 33(4), pp. 453–460. doi: 10.1016/j.jopan.2016.02.014.

CDC (2010) 'Frequently Asked Questions about Catheter-associated Urinary Tract Infections'.

Fritsch, P. F. *et al.* (2019) 'Reinforcing a Catheter-Associated Urinary Tract Infection (CAUTI) Bundle Compliance Decreases Overall Catheter Days and CAUTIs', *American Journal of Infection Control*, 47(6), p. S22. doi: 10.1016/j.ajic.2019.04.035.

Gagnon, M. P. *et al.* (2015) 'Applying the Theory of Planned Behaviour to understand nurse intention to follow recommendations related to a preventive clinical practice', *Journal of Research in Nursing*, 20(7), pp. 582–593. doi: 10.1177/1744987115611715.

Haile, T. G., Engeda, E. H. and Abdo, A. A. (2017) 'Compliance with Standard Precautions and Associated Factors among Healthcare Workers in Gondar University Comprehensive Specialized Hospital, Northwest Ethiopia', *Journal of Environmental and Public Health*, 2017. doi: 10.1155/2017/2050635.

Haque, M. *et al.* (2018) 'Health Care-Associated Infections: An Overview', *Infection and Drug Resistance*, 11, pp. 2321–2333.

Institute of Medicine (US) Committee on the Long-Run Macroeconomic Effects of the Aging U.S. Population (2012) 'Aging, Productivity, and Innovation', in *Aging and the Macroeconomy: Long-term Implications of An Older Population*. Washington D.C.: National Academies Press, pp. 106–121. doi: 10.5860/choice.50-5701.

Jun, J., Kovner, C. T. and Stimpfel, A. W. (2016) 'Barriers and facilitators of nurses' use of clinical practice guidelines: An integrative review', *International Journal of Nursing Studies*, 60, pp. 54–68. doi: 10.1016/j.ijnurstu.2016.03.006.

Kan, M. P. H., Fabrigar, L. R. and Fishbein, M. (2017) 'Encyclopedia of

Personality and Individual Differences', *Encyclopedia of Personality and Individual Differences*, pp. 1–8. doi: 10.1007/978-3-319-28099-8.

Kausuhe, J. *et al.* (2017) 'Hubungan Pemasangan Kateter Urine dengan Kejadian Infeksi Saluran Kemih di RSU GMIM Pancaran Kasih Manado', *e-Journal Keperawatan*, 5(2).

Kemenkes RI (2017) *Peraturan Menteri Kesehatan Republik Indonesia Nomor 27 Tahun 2017 tentang Pedoman Pencegahan dan Pengendalian Infeksi di Fasilitas Pelayanan Kesehatan*. Jakarta.

Kusnanto, K. *et al.* (2020) 'Theory of Planned Behavior Development Model to Compliance Behavior in Vap Prevention at ICU', *Jurnal Keperawatan Soedirman*, 15(1). doi: 10.20884/1.jks.2020.15.1.1044.

Menkes RI (2017) 'Peraturan Menteri Kesehatan Republik Indonesia Nomor 40 Tahun 2017 Tentang Pengembangan Jenjang Karir Profesional Perawat Klinis'.

NIH (2012) *Theory at a Glance A guide For Health Promotion Practice*. 2nd edn. Marryland: National Intitute of Health.

Nursalam, N. *et al.* (2019) 'Analysis of factors on reward system in the hospital', *Indian Journal of Public Health Research and Development*, 10(1), pp. 490–494. doi: 10.5958/0976-5506.2019.00096.2.

Nyirenda, M. and Mukwato, P. (2016) 'Job satisfaction and attitudes towards nursing care among nurses working at Mzuzu Central Hospital in Mzuzu, Malawi', *Malawi Medical Journal*, 28(4), pp. 159–166.

Park, S. and Lee, T. (2016) 'Predicting Patient Safety Behaviors of Nurses in Inter-Hospital Transfer', *Journal of Korean Academy of Nursing Administration*, 22(3), p. 230. doi: 10.11111/jkana.2016.22.3.230.

Perdana, M., Haryani, H. and Aulawi, K. (2017) 'Hubungan Pelaksanaan Perawatan Indwelling Kateter dengan Kejadian Infeksi Saluran Kemih', *Jurnal keperawatan Klinis dan Komunitas*, 01(01), pp. 17–27.

Price, B. (2015) 'Understanding Attitudes and Their Effects on Nursing Practice', *Nursing Standard*, 30(15), pp. 50–57.

Sari, E. W. and Satyabakti, P. (2015) 'Perbedaan risiko infeksi nosokomial saluran kemih berdasarkan kateterisasi urin, umur, dan diabetes melitus', *Jurnal Berkala Epidemiologi*, 3(2), p. 206.

WHO (2010) *Health Care-Associated Infections: Fact Sheet*. Geneva. doi: 10.1007/s00238-013-0923-3.

WHO (2018) *Advanced Infection Prevention and Control Training Prevention of Catheter-associated Urinary Tract Infection (CAUTI)*. Geneva.

Winasih, R., Nursalam, N. and Kurniawati, N. D. (2015) 'Cultural Organization and Quality of Nursing Work Life on Nurses Performance and Job Satisfaction in Dr. Soetomo Hospital, Surabaya', *Jurnal NERS*, 10(2), p. 332. doi: 10.20473/jn.v10i22015.332-342.

Zúñiga, F. *et al.* (2015) 'Are Staffing, Work Environment, Work Stressors, and Rationing of Care Related to Care Workers' Perception of Quality of Care? A Cross-Sectional Study', *Journal of the American Medical Directors Association*, 16(10), pp. 860–866. doi: 10.1016/j.jamda.2015.04.012.