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ORIGINAL ARTICLE

Development of indicator of the personal initiative behavior of head nurses at private hospitals in Thailand

Chutchavarn Wongsaree[1], Netchanok Sritoomma[2], and Suchittra Luangamomlert[2]

[1]Ph.D. Candidate in Nursing Management program, Christian University of Thailand, Nakhon Pathom, Thailand.
[2]College of Nursing, Christian University of Thailand, Nakhon Pathom, Thailand

Corresponding author: *Netchanok Sritoomma* ***E-mail****: netchanoksri@christain.ac.th*

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ABSTRACT

Personal initiative behavior of head nurses at private hospitals in Thailand is an essential tool for highly efficient performance at the individual and organizational levels, leading to competitive advantage. This study aimed to develop indicators of Personal Initiative Behavior (PIB) for head nurses in private hospitals in Thailand. This study used a quantitative research to develop the PIB scale based on the personal initiative concept of Frese and Fay (2001). The samples were head nurses who worked in private hospitals accredited with international quality standards in Thailand. This study used 7 steps of Brislin's method for scale development. The content validity was tested by 7 experts in the nursing management field with a CVI at 1.0. The internal consistency reliability with Cronbach's alpha coefficient for Personal initiative components; self-starting, pro-active and persistent were .73, .78 and .80, respectively. Overall reliability was .08, and testing of the construct validity was performed by using exploratory factor analysis and confirmatory factor analysis with 200 head nurses at private hospitals. The PIB consisted of three components with nine indicators: 1) Self-starting behavior composed of 3 indicators (factor loading = .88), 2) Pro-active behavior composed of 3 indicators (factor loading = .92), and 3) Persistent behavior composed of 3 indicators (factor loading = .83). The developed instrument was congruent with empirical data (P-value = .893, chi square = 15.8, df= 24, χ^2 /df = .660, GFI = .983, AGFI = .968, RMR = .011, RMSEA = .000, CFI = 1.000). Cronbach's alpha coefficient for reliability after construct validity for overall reliability was .80. The developed indicators can be used to measure the level of personal initiative behavior of head nurses in private hospitals particularly in the areas of self-starting behavior, pro-active behavior and persistent behavior, by having a good knowledge of innovation management and creativity.

Keywords: personal initiative behavioral, scale development, head nurses, private hospitals in Thailand

INTRODUCTION

Development of knowledge transferable skills for effective performance is important in the 21st century. Personal initiative skills are another skill recommended for every nurse to have by academic evidence, particularly head nurses who play an important role in continual improvements to management quality in patient units in accordance with hospital policy. [1] Head nurses also play the direct management role at nursing units, implementing nursing policy into practice, creating effective nursing services for competitive advantage, enhancing nursing unit performance and patient safety. [2-3] To create high nursing-unit performance, head nurses should be leaders with creative thinking, having management knowledge in creating innovations such as budget procurement, team and network development, working proactively to realize ideas, effective problem solving, being good role models for team members in the areas of work and living in society[4].

Thailand has 43 Joint Commission International (JCI) accredited private hospitals. JCI specified two main quality standards consisting of standards in the area of includes two main sections, one on patient-centered care and the other on health care organization management with minimum accreditation criteria in each area specified at 90 percent. According to analysis of JCI quality criteria and standards, JCI standards can be seen to have placed importance on a person's work ability as an important factor in driving the organization toward goals in standards specified by JCI. In addition, the minimum accreditation criteria of 90 percent specified by JCI is high criteria indicating that persons working in JCI-accredited private hospitals need to be highly competent to have high performance efficiency.

Head nurses are also positions recognized as important for JCI-accredited private hospitals because head nurses are considered a factor of the organization's success[5]. In Thai nursing organization culture, nursing unit members usually consider head nurses as a role model for work[6]. Therefore, high performance efficiency can be deduced to result from head nurses with high personal initiative behaviors and nursing unit members will absorb this model from head nurses[7]. From another perspective, evidence-based research on successful behaviors have brought about highly effective performance among people and work. In the 21st century found personal initiative behaviors to be related to work at both the individual level[8-10] and the organization level[9-12], creative behaviors and innovation[13] in determining organization goals[9], stress management, work risks and safety[14], expertise in leading teams to serve society[15], management of work environment and climate[16]. Therefore, head nurses at private hospitals should have personal initiative behaviors, which will result in a drive for vision leading to highly effective outcomes.

Personal initiative (PI) defined as a behavior syndrome resulting in an individual's taking an active, persistent, and self-starting approach to work goal and going beyond what is formally required in a given job. Personal initiative concept developed by Frese and Fay (2001). Personal initiative has three main dimensions[9] consisting of the following: (I) self-starting behavior; (II) proactive behavior; and (III) persistent behavior. Self-starting behavior is the development of personal work behaviors to create new things that benefit the nursing organization. Proactive behavior is the ability to manage work creatively, innovate, accept criticism, discover work problems or barriers and use data to plan prevention of problems along with updating work plans by seeing benefit

from opportunities in the future. Persistent behavior is the determination to discover problems that will become ongoing barriers in working and the use of creative ideas in work process to successfully develop work.

Personal initiative behaviors need instruments and assessment guidelines. The researcher modified and developed Brislin's instrument (1986) with the following four main steps: forward translation of the English version to the Thai version, review of the translated version by an expert panel, blind back-translation, and comparison of the English version to the back-translated version for linguistic and cultural equivalence[14]. Currently, there is no instrument for measuring personal initiative behavior indicators among head nurses. Therefore, the researcher modified, developed and tested the personal initiative behavior scale for head nurses in private hospitals based on the instrument of Frese, Fay, Hilburger, Leng & Tag (1997)[15].

This study aimed to develop personal initiative behavior indicators for head nurses in private hospitals in Thailand. The developed instrument can be used to measure personal initiative behaviors of head nurses and can be used as data for developing personal initiative behaviors among head nurses in the future.

RESEARCH OBJECTIVES

To establish and develop a personal initiative behavior scale for head nurses in private hospitals in Thailand.

REVIEW LITERATURE

According to several previous studies, three types of personal-initiating behavior measurement were developed. as following; (1) Observation or situational interview questionnaire, this analyzed the content of the answer and give advice accordingly on rubric score, with a score from 1 – 5, This type of questionnaire was that behavior can be measured in close to actual practice[9]. (2) Situational judgment test on personal initiative (SJT-PT) there was a bipolar scale, with everyone who took the questionnaire was to be a subject to the same set of circumstances and there was options to respond to the same situation[10], and (3) Self-report personal initiative which likert scale an evaluation was a questionnaire that has been widely popular by Frese et al. (1997) [15] has developed the original of 7 questions among bank managers and employees in Germany, reliability with Cronbach's alpha coefficient was .87. Frese et al. (2007) [16] confirmed elements that were analyzed construct validity with confirmatory factor analysis with statistical values at p-value = .563, chi square = 79.5, df= 39 , RMSEA = .062, CFI =.981. Afterward, Yan Jin and Xie Xiaoyun (2009) [17] tested the personal initiative theory in China based on Frese and Fay (2001). The samples consisted of 357 managers and employees in the service entrepreneur. The scale of personal initiative was developed of 20 questions with statistical values at $\chi 2$ / df = 2.22, RMSEA = .07, GFI = .96, AGFI = .92, NFI = .94, and CFI =.97. For reliability with Cronbach's alpha coefficient in areas of self-starting, proactive, and persistent were .83, .80, and .81 respectively. The personal initiative of executives in China, whose cultures in Asia were similar to Thailand. Therefore, this study might be able to obtain the construct validity and components of personal initiative behavior academically.

METHODS

The population used in this research was 400 head nurses in private hospitals. Determining sample size by using the sample calculation from the formula of Krejcie and Morgan, determine the population representation at the 95%

confidence level and the tolerance level 0.05% to get complete information, data was collected to prevent loss of 20% of the sample. The researchers then adjusted the size of the group according to the formula of Gupta and the faculty by calculating the dropout rate of ten percent. The sample group in this study was 200 head nurses with simple random sampling.

INDICATORS DEVELOPMENT

Development of the personal initiative behavior scale for head nurses in private hospitals in Thailand was a modification and adaptation of instruments for nursing field after the researcher received permission from Frese and Fay (2001)[9] who owns the scale's copyrights. The scale was composed of the following three elements: (I) self-starting behavior of head nurses; (II) proactive behavior of head nurses; and (III) persistent behavior of head nurses. The researcher sent the original scale in English to be translated at a language and nursing research instrument translation center by using the back-translation with monolingual test method according to Brislin's steps as follows (1986)[18], Steps of Brislin's method followed Figure 1:

Step 1 – Forward translation from the source language into the target language or Thai by using one expert in English translation from the language institute to translate the questionnaire from English to Thai.

Step 2 – Review of the translated version by reviewer. At this stage, accuracy and suitability of translation was tested with the Thai questionnaire. The reviewer was not the same person as the translator in the first step. In this second step, the researcher and advisory professors jointly checked language accuracy and suitability.

Step 3 – Backward translation from Thai to English. The back-translator in this study was a bilingual person with expertise in English and nursing administration who is not the same person as the translator in the first step and had never seen the original scale before.

Step 4 – Comparison of the original version and the back-translated version. In this step, the researcher considered suitability of language and culture. If any question was unsuitable, the researcher analyzed to determine the step with translation problems. If problems occurred in translating the original scale from English to Thai, the researcher began from the first step before checking language suitability and accuracy with advisory professors.

Step 5 – Modification and adaptation. In cooperation with advisory professors, the researcher modified questions from the original scale. Originally, the scale had 7 questions and a five-point answer scale was used ranging from "not true at all" (1) to "very true" (5). To cover meanings of minor characteristics and maintain consistency with the element analysis principle of Hair et al. (2010)[19], 2 questions were added, bringing the total to 9 questions. The researcher sent the personal initiative behavior scale to 7 qualified experts who tested the questionnaire and provided recommendations on construct validity, later contents and modifications to questions.

In testing instrument reliability, the researcher tested the scale with the sample who were head nurses from JCI-accredited private hospitals in order to confirm the respondents' accurate understanding of each question and use recommendations to better modify questions. The sample consisted of 30 head nurses from JCI-accredited private hospitals who had similar qualifications to the sample. Data were

tested for reliability before data collection from 200 subjects in order to have sufficient data for element analysis[19]. Data were collected at 28 JCI-accredited private hospitals from 1 March to 30 April 2020. Hospitals were selected by simple random sampling and the sample was selected by drawing lots without returning lots until the desired number of subjects was selected.

Criteria and interpretation of mean scores for personal initiative behavior were designated from the following five class intervals[20]: 1.00-1.80 meant personal initiative behavior at the lowest level; 1.81-2.60 meant personal initiative behavior at a low level; 2.61-3.40 meant personal initiative behavior at a medium level; 3.41-4.20 meant personal initiative behavior at a high level; and 4.21-5.00 meant personal initiative behavior at the highest level.

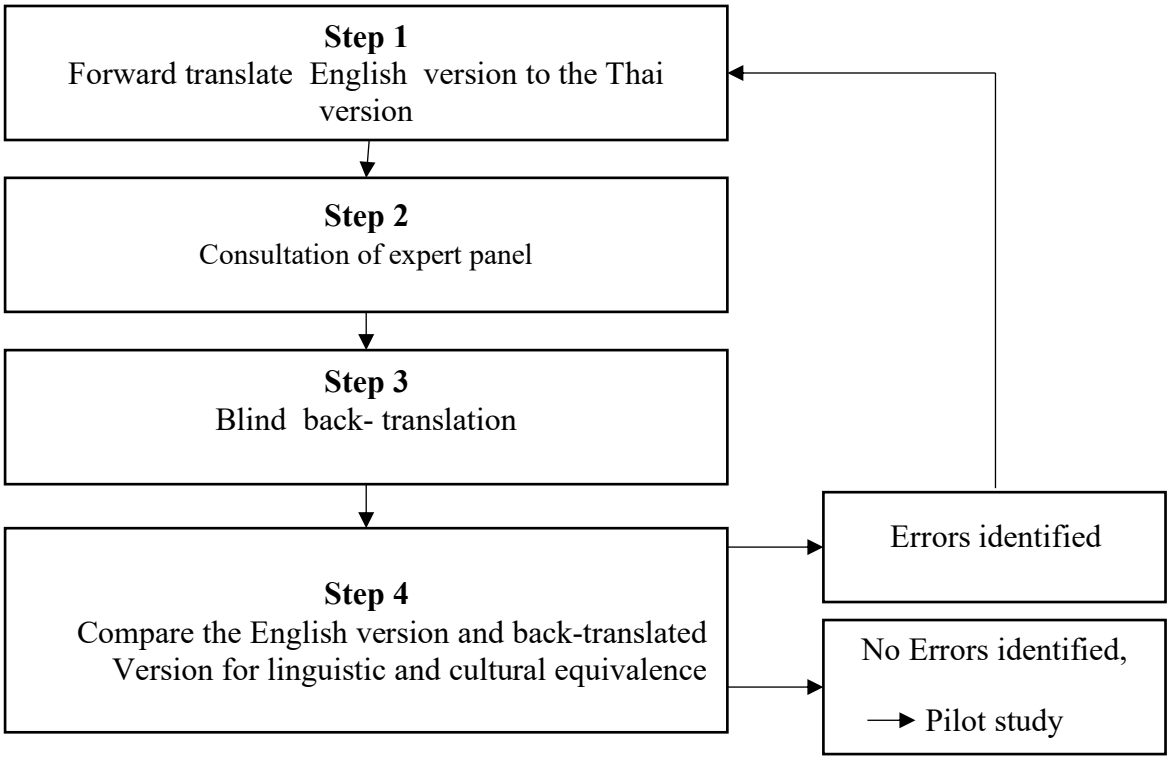


Figure 1 Steps of Brislin's method of translation application

ETHICAL CONSIDERATIONS

The Ethical Committee of the Christian University of Thailand approved this study (Registration No: N 09 / 2562) on December 21, 2019. Furthermore, permission was obtained from the directors of the private hospitals in Thailand where the data were collected. Each participating head nurse was informed about the purpose and benefits of the study. The subjects then gave their written consent before data collection was started. The data obtained from the questionnaires were kept confidential. All data will be identified by an identification code to maintain participant confidentiality. Informed consent forms containing names or other personal identifiers will be stored separately from the questionnaires and identified by code numbers. All databases will be secured with password-protected access systems. The findings are presented from an overall perspective, and the participants had the right to cancel participation in the study at any time

without any impact. Consent was implied when the participants were willing to complete and return the questionnaires to the researchers.

DATA ANALYSIS

The data were analyzed by using the following statistical methods:

1) Descriptive statistics were used to determine means and standard deviations for personal initiative behavior with a software package.

2) Exploratory factor analysis (EFA) was used to organize the components of personal initiative behavior with a software package.

3) Confirmatory factor analysis was performed to test the goodness of fit of the factors in the model. Weights were assigned to construct indicators and empirical data to determine the weights of the main variables used in constructing the indicators with a software package.

4) Cronbach's alpha coefficient was used to measure the internal consistency of the scale and to describe the extent to which all of the items in a test measured the same construct with a software package.

RESULTS

Two hundred head nurses from private hospitals in Thailand who completed questionnaires in person, most of the head nurses were female (99.5%), aged 36-40 years (28.5%), married (67%), attained education at the level of a bachelor's degree (81.0%), completed specialized education (25.0%), had professional work experience at 11-15 years (27%) and had patient ward management experience in the range of 6-10 years (36%).

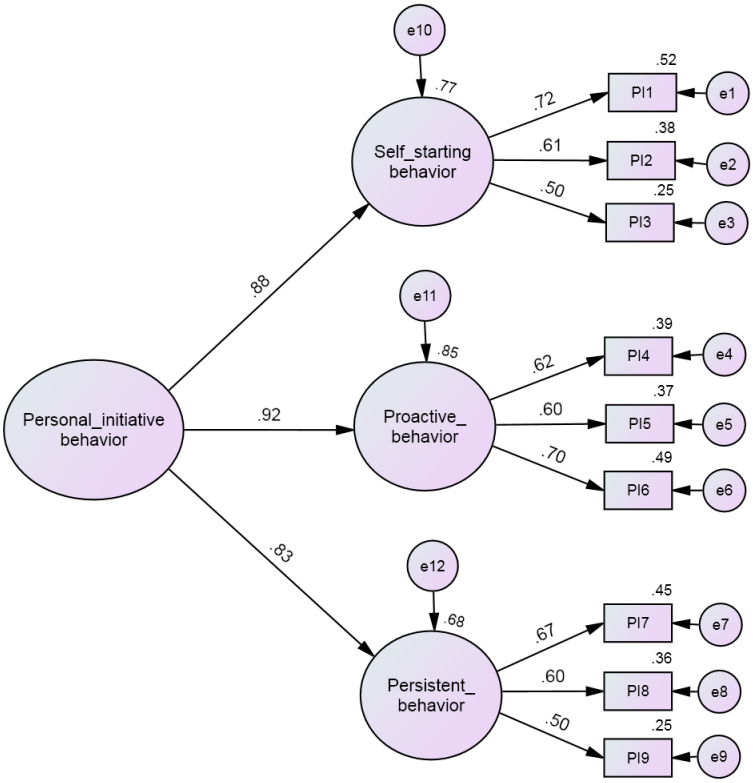
The content validity index (CVI) of 9 questions in the scale was at 1.00 Reliability testing of the personal initiative behavior scale among 30 subjects resulted in a reliability score of .79 while testing in 200 subjects resulted in a reliability score of .80. Factor analysis using Bartlett's test of sphericity was statistically significant (P value < .01) and the Kaiser Meyer Olkin measure of sampling adequacy (KMO) was .69, indicating that the variables were related. The data had high suitability for analysis by using factor analysis statistics[19]. Construct validity was determined through exploratory factor analysis, extracting components by principle component factor analysis and using orthogonal rotation toward simple structure with the Varimax method. The relevant component selection criteria consisted of considering factors with eigenvalues exceeding 1.00 with component explanations for the three indicators. In addition, each indicator had a factor loading of .40 or more[20].

According to the factor analysis, personal initiative behavior was found to have 9 indicators for the three components. The components of personal initiative behavior consisted of self-starting behavior (3 indicators) , pro-active behavior (3 indicators) , persistent behaviors (3 indicators). Of the total variance, 66. 89% was accounted for by the factors. All of the factor loadings of the personal initiative behavior indicators were in a positive range. The self-starting behavior of head nurse indicators were within a range of .60 - .77, while the range for pro-active behavior of head nurse indicators was .78 - .86 and the persistent behavior of head nurse indicators was within a range of .83 – 93.

Table 1 Eigenvalues, percentage of variance, percentage of accumulated variance and number of indicators for each component of the personal initiative behavior of head nurses.

Component Name	Eigenvalues	Percentage of Variance	Percentage of Accumulated Variance	Number of Indicators
Persistent Behavior	2.34	26.08	26.08	3
Pro-active Behavior	2.09	23.29	49.39	3
Self-starting Behavior	1.57	17.51	66.89	3

Confirmatory factor analysis was used to test whether the data fit the measurement of how well the data fit the model of factors and their indicators, namely to test whether the measures of a construct were consistent with the researchers' understanding of the nature of that construct or factor. Confirmatory factor analysis was used to calculate fit indices to test the adequacy of the model, or the fit between the actual data and the hypothesized model tests, including chi-square goodness of fit, root mean square error of approximation (RMSEA) and comparative fit index (CFI). Additional indices were the goodness of fit index (GFI) and the adjusted goodness of fit index (AGFI).



P-value = .893, chi square = 15.8, df= 24, χ^2 /df = .660, GFI = .983, AGFI = .968, RMR = .011, RMSEA = .000, TLI =1.000, CFI = 1.000

Figure 2: Confirmatory factor analysis of personal initiative behavior of head nurses.

Confirmatory factor analysis found the personal initiative behavior model to be consistent with the evidence-based data and that the research model fit the empirical data well (Table 2).

Table 2 Goodness of fit indices for checking consistency with empirical data by confirmatory factor analysis.

Goodness of Fit Indices	Acceptable Fit[21,22]	Confirmatory Factor Analysis	Interpreted Results
Chi-square statistics (p-value)	>.05	.893	Fit
χ^2 /df (CMIN/DF)	≤5	.660	Fit
Root Mean Square Residual: RMR	≤.05	.011	Fit
Goodness-of-Fit: GFI	0.00 - 1.00	.983	Fit
Adjusted Goodness-of-Fit: AGFI	>.90	.968	Fit
Root Mean Square Error of Approximate (RMSEA)	<.08	0.000	Fit
Tucker-Lewis index (TLI)	> .95	1.000	Fit
Comparative Fit Index (CFI)	>.90	1.000	Fit

The results of the factor score and the analysis of the factor scores found the component with the highest overall factor loading to be the personal initiative behavior of head nurses, followed by self-starting behavior, pro-active behavior and persistent behavior (Table 3).

Table 3: Mean, *standard deviation (S.D.) and* factor loadings of personal initiative behavior of head nurses indicators for the three components (n = 200)

Observed Variable	Mean	S.D.	Factor Loading
Self-starting Behavior of Head Nurses	**4.36**	**.56**	**.88**
PI 1. You were accepted for having management knowledge in creating innovations such as budget procurement, team and network development.	4.20	.68	.72
PI 2. You are able to plan development of creative works and direct work to achieve success by yourself.	4.31	.59	.61
PI 3. You accept opinions from others and use recommendations to make modifications and develop creative work successfully according to goals.	4.36	.54	.50
Pro-active behavior of head nurses	**4.31**	**.61**	**.92**
PI 4. You see opportunities in creating your work to generate more benefit and value.	4.36	.55	.62
PI 5. When you have an opportunity to do important work, you use your opportunity to achieve success quickly.	4.36	.52	.60

Observed Variable	Mean	S.D.	Factor Loading
PI 6. You are enthusiastic and determined to successfully implement creative ideas in practice.	4.25	.58	.70
Persistent behavior of head nurses	**4.29**	**.61**	**.83**
PI 7. You use your skills to solve many types of work problems with greater coverage of issues.	4.42	. 61	.67
PI 8. You are able to improve your abilities to match the organization's expectations.	4.37	.56	.50
PI 9. You use mistakes to analyze and make plans for correcting mistakes in managing work.	4.29	.65	.60
Total	4.32	.60	-

In Step 4, the instrument's reliability was assessed and the collected data was analyzed for reliability based on structural accuracy. When reliability of lesser characteristics was analyzed by using Cronbach's Alpha Coefficient, the elements had the following internal consistency scores: self-starting behavior (factor-loading = .88, Mean = 4.36, S.D. = .56), proactive behavior (factor loading = .92, Mean = 4.31, S.D. = .61) and persistent behavior (factor loading = .83, Mean = 4.29, S.D. = .61). This study found that the proactive behavior component was the most valuable factor loading weight. These results showed that the proactive behavior component was a critical component of the head nurses' personal initiative at JCI-certified private hospitals in Thailand[21].

DISCUSSION

According to the process of instrument development by Brislin's translate instrument[18], good instruments should have internal consistency indicators; for example, each question in an instrument should measure the same characteristics, scores on correlations between items should be 0.30 to 0.80[23] and each question should have Cronbach's alpha coefficient of > .70[24]. Personal initiative behavior indicators were developed based on the concept of Frese and Fay (2001) with a focus on personal initiative behaviors of head nurses from JCI-accredited private hospitals. Indicator content was checked by seven experts and found to have a content validity index (CVI) of 1.0 and Cronbach's Alpha Coefficient of 0.80. Test results for ability to create indicators, effectiveness of personal initiative behaviors among head nurses in private hospitals in 3 elements and 9 indicators indicated that personal initiative behaviors had good internal consistency and were consistent with the evidence-based data[21-24](P-value = .893, chi square = 15.8, df= 24, χ^2 /df = .660, GFI = .983, AGFI = .968, RMR = .011, RMSEA = .000, CFI = 1.000).

The indicators of personal initiative behavior among head nurses in private hospitals developed in this study had two additional questions, bringing the total number of questions to nine in order to cover the context of nursing administration science. This was different from the original scale, which contained 7 questions[18]. All of the questions were consistent with the three main elements of self-starting behavior (Factor Loading = .92), pro-active behavior (Factor Loading = .88) and persistent behavior (Factor Loading = .83). All of the questions were consistent with the evidence-based data described by Frese and Fay[9]. When analysis was performed at the question level, starting-level nursing administrators with

initiative were found to have outstanding knowledge in administration, creativity in innovating, use of skills to solve many forms of work problems, enthusiasm and persistence in implementing creative ideas in practice to create early success. This was different from business organizations in that initiative was outstanding in building and maintaining relationships with trading partner networks and initiative in industrial factories which helped to reduce work errors and mistakes[18], possibly because persons eligible for promotion in the field of nursing may have prior developments in the aforementioned areas. In this study, personal initiative behavior was categorized with greater clarity. Questions were created to cover new elements and analyses by developing personal initiative behavior in nursing administration science. The findings were satisfactory and personal initiative behavior among head nurses were expected to make work at the personal level[9-11] and the organizational level[9-12] with creative and innovative behaviors[13], organization goal determination[9], and stress at work, risk and safety management[14] more effective, and personal initiative is likely to have a positive effect on nursing administration and develop in diverse generations' nurses. Which is a new phenomenon in field nursing profession in Thailand[25].

The components of the proactive behavior were the most valuable factor loading weight (factor loading = .92, Mean = 4.31, S.D. = .61), discussed whether the head nurses in private hospitals with JCI accreditation in Thailand have to an enthusiastic and determined to successfully implement creative ideas in practice, having an opportunity to do important work, using an opportunity to achieve success quickly, and seeking opportunities in creating your work to generate more benefit and value for an organization. In the context of the head nurses in private JCI-certified hospitals must operate in a market-oriented and meet high levels of satisfaction with stakeholders in accordance with international operating standards. To achieve efficient operations, head nurses want to take a proactive approach to continuing operations, this is consistent with Frese and Fay's theory of personal-initiative specify components of the proactive behavior that person as proactive approach by individuals will be able to deal with problems in task and be able to prepare for further opportunities effectively[9]. Also, this scale of personal initiated behavior was developed with the alpha coefficient of Conbarch similar to that of the Frese et al[16]. and Yan Jin, & Xie Xiaoyun [17] studies.

CONCLUSIONS

Indicators of personal initiative behavior had an accurate construct consistent with the personal initiative behavior and elements in 3 areas under 9 questions. The findings revealed that head nurses to have outstanding personal initiative behavior in the areas of pro-active behavior, self-starting behavior and persistent behavior. Therefore, the developed indicators were suitable for measuring personal initiative behavior among head nurses of private hospitals in Thailand's contexts.

RECOMMENDATIONS

Based its scale development, the personal initiative behavior indicators should be described as a useful research instrument in the nursing management field. Therefore, the researchers would like to offer the following recommendations for using this indicators for nursing administration practice as followings: (1) Directors of nursing in private hospitals should make policies to develop personal

initiative skills or behaviors a mandatory competency in head nurses; (2) Directors of nursing in private hospitals should use the personal initiative behavior indicators as a form for assessing and selecting nurses who will become new head nurses or salary promotion; (3) Directors of nursing and head nurses should use personal initiative to design personnel development programs in nursing organizations to encourage creative ideas, self-improvement and enthusiasm in working to achieve success with determination to solve work problems creatively.

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REFERENCES

1. Tongmuangtunyatep K., Kunaviktikul W., Nantsupawat R., Akkadechanunt T. Development of a competency assessment scale for head nurses in community hospitals. PRIJNR 2015; 19(2): 122-134. (in Thai)
2. Lyle-Edrosolo G., Waxman KT. Aligning healthcare safety and quality competencies: quality and safety education for nurses (QSEN), The Joint Commission, and American Nurses Credentialing Center (ANCC) magnet® standards crosswalk. Nurse Leader 2016; 14(1): 70-75.
3. Rahman HA., Shamsudin AS. The impact of patient to nurse ratio on quality of care and patient safety in the medical and surgical wards in Malaysian private hospitals: A cross-sectional study. JSTOR 2015; 11(9): 326.
4. Gunawan J., Aungsuroch Y. Managerial competence of first-line nurse managers: A concept analysis. Int. J nurs pract 2017; 23(1): e12502.
5. Cockburn IM., Henderson R., & Stern S. The impact of artificial intelligence on innovation (No. w24449). *NBER* 2018.
6. Wongchantorn N., Sritoomma N., & Wongkhomthong J. Development of organizational effectiveness indicators for delivery departments at the secondary level hospitals affiliated to the thai ministry of public health. IJPHRD 2018; 9(10): 471-476. doi: 10.5958/0976-5506.2018.01389.X
7. Pommala W., Sritoomma N., & Wongkhomthng J. The behaviors of ethical leadership of division head nurses at advanced hospitals under ministry of public health: A qualitative study. IJPHRD 2018; 9(10):499-503. doi:10.5958/0976-5506.2018.01394.3
8. Cockburn IM., Henderson R., Stern S. The impact of artificial intelligence on innovation (No. w24449). National Bureau of Economic Research [Internet]. [cited 2020 Oct 10]. Available from: http://www.nber.org/papers/w24449
9. Frese M., Fay D. Personal initiative (PI): An active performance concept for work in the 21st century. In B.M. Staw & R.M. Sutton (Eds.), Research in Organizational Behavior. Amsterdam: Elsevier Science 2001.
10. Bledow R., Frese M. A situational judgment test of personal initiative and its relationship to performance. SCI *Journal* . 2009; 62(2): 229-258.
11. Lisbona A., Palaci F., Salanova M., Frese, M. The effects of work engagement and self-efficacy on personal initiative and

performance. Psicothema. 2018; 30(1): 89-96.
12. Den Hartog DN., Belschak FD. Personal initiative, commitment and affect at work. **J**. Occup. Organ. Psychol.. 2007; 80(4): 601-622.
13. Khalili A. Creativity and innovation through LMX and personal initiative. JOCM 2018; 31(2) : 323-333. doi.org/10.1108/JOCM-09-2016-0183
14. Drift DV. The role of personal initiative. Master Thesis Human Resource Studies. Faculty of Social and Behavior Science, Tilburg University 2019.
15. Frees M., Fay D., Hilburger T., Leng K., Tag A. The concept of personal initiative: Operationalization, reliability and validity in two German samples. BPS Journals 1997; 70:139-161.
16. Frese, Garst, and Fay. Making things happen: Reciprocal relationships between work characteristics and personal initiative in a four-wave longitudinal structural equation model. J Appl Psychol 2007; 92(4) : 1084-1102.
17. Yan Jin, & Xie Xiaoyun. (2009). The proactive spirit of enterprise employees: structure exploration and verification. JBEM 2009;(10): 34-39.
18. Brislin RW. *The wording and translation of research instruments.* In W. J. Lonner & J. W. Berry (Eds.), *Cross-cultural research and methodology series, Field methods in cross-cultural research.* Sage Publications *1986; 8:* 137–164.
19. Polit DF, Beck CT. Nursing research: Principles and methods. Lippincott Williams & Wilkins 2004.
20. Tan J, editor. Advancing Technologies and Intelligence in Healthcare and Clinical Environments Breakthroughs. IGI Global 2012.
21. Hair JF., Black WC., Babin BJ., Anderson RE., Ham Ronald L. Multivariate Data analysis. 7th ed. New Jersy: Prentice Hall 2010.
22. Bollen, A.K. Structural Equations with Latent Variables. New York: Wiley Publishing 1989.
23. Burns N., Grove SK. The Practice of Nursing Research, Conduct, Critique, and Utilization. 4th Edition, W.B. Saunders Company, Philadelphia 2011
24. Nunnally JC. Psychometric Theory. New York, NY: McGraw-Hill 1978**.**
25. Wongsaree C., Phunthong S., and Jantiya S. Experience of Generation Z Nursing Professional Do Not Like the Department of Worked. J Royal Thai Army Nurses 2020; 21(1): 136 – 146. (in Thai)