

ORIGINAL ARTICLE

Development of Indicators of the Transformational Leadership Behavior of Head Nurses in Private Hospitals in Thailand

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ABSTRACT

Indicators of the transformational leadership behavior of head nurses in private hospitals in Thailand are a necessary tool to aid in the development of nursing organizations in the highly competitive field of private hospitals, especially in the area of nursing services which require innovation in services to respond to the demands of patients and family members.

This study developed indicators for transformational leadership behavior of head nurses in private hospitals in Thailand by using quantitative methods. The development of transformational leadership behavior indicators are presented as follows: 1) definition of operational terms; 2) creation of questions from the definition of terms, which resulted in 65 indicators of 4 components; 3) content validity testing by five experts, with a CVI = 0.95; 4) determining the internal consistency reliability with thirty head nurses of nurses in private hospitals in Thailand, with a Cronbach's Alpha Coefficient for inspirational motivation, individualized consideration, idealized influence, and intellectual stimulation were 0.96, 0.96, 0.93, 0.93, Overall reliability was 0.98; 5) testing of the construct validity by using factor analysis to extract indicators, with 205 head nurses in large private hospitals in Thailand. The research instrument for measuring transformational leadership behavior contained four components with a total of 38 indicators: 1) intellectual stimulation is composed of 10 indicators, 2) inspirational motivation is composed of 11 indicators, 3) individualized consideration is composed of 11 indicators, and 4) idealized influence is composed of 6 indicators. The developed instrument was congruent with empirical data ($\chi^2 = .452.53$, CMIN/DF = .868, CFI = 1.000, GFI = .900, AGFI = .858, RMR = .015, RMSEA = .000, 6) Cronbach's alpha coefficient for reliability after construct validity for intellectual stimulation, inspirational motivation, individualized consideration, and idealized influence were 0.93, 0.92, 0.92, 0.87, and for overall reliability was 0.97.

The developed indicators can be used to measure the level of behavior of transformational leadership behavior of the head nurses and nursing administrators should use the information to develop transformational leadership behavior of the head nurses, especially inspirational motivation by making helping nursing team members see the future and talking about possible future images conditions.

Keywords: Indicators, Transformational leadership behavior, Head nurses in private hospitals

การพัฒนาตัวชี้วัดพฤติกรรมภาวะผู้นำการเปลี่ยนแปลงหัวหน้าหอผู้ป่วย โรงพยาบาลเอกชนในประเทศไทย

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บทคัดย่อ

ตัวบ่งชี้พฤติกรรมภาวะผู้นำการเปลี่ยนแปลงของหัวหน้าหอผู้ป่วยในโรงพยาบาลเอกชนในประเทศไทย เป็นเครื่องมือที่จำเป็นสำหรับการพัฒนาองค์กรพยาบาลในสถานการณ์ที่มีการแข่งขันสูงของโรงพยาบาลเอกชน โดยเฉพาะการบริการพยาบาลที่ต้องการนวัตกรรมบริการเพื่อตอบสนองต่อความต้องการของผู้ป่วยและสมาชิกในครอบครัว

การศึกษานี้ ได้พัฒนาตัวบ่งชี้พฤติกรรมภาวะผู้นำการเปลี่ยนแปลงของหัวหน้าหอผู้ป่วยในโรงพยาบาลเอกชนในประเทศไทย โดยใช้วิธีการเชิงปริมาณการพัฒนาระดับตัวบ่งชี้พฤติกรรมภาวะผู้นำการเปลี่ยนแปลงมีดังนี้ 1) กำหนดคำนิยามศัพท์เชิงปฏิบัติการ 2) การสร้างข้อคำถามจากคำจำกัดความได้ 65 ตัวชี้วัด 4 องค์ประกอบ 3) ตรวจสอบความตรงตามเนื้อหาโดยผู้เชี่ยวชาญห้าคนมี CVI = 0.95 4) หาค่าความเที่ยง โดยนำไปทดลองใช้กับหัวหน้าหอผู้ป่วยจำนวน 30 คนในโรงพยาบาลเอกชนในประเทศไทยได้ค่าความเที่ยง การสร้างแรงบันดาลใจ การคำนึงถึงความเป็นปัจเจกบุคคล การมีอิทธิพลอย่างมีอุดมการณ์ และการกระตุ้นทางปัญญาเท่ากับ 0.96, 0.96, 0.93, 0.93 ; 5) การทดสอบความตรงเชิงโครงสร้างโดยใช้การวิเคราะห์องค์ประกอบ โดยนำไปใช้กับมีหัวหน้าหอผู้ป่วยจำนวน 205 คนในโรงพยาบาลเอกชนขนาดใหญ่ในประเทศไทย เครื่องมือวิจัยในการวัดพฤติกรรมภาวะผู้นำการเปลี่ยนแปลงประกอบด้วย 4 องค์ประกอบรวม 38 ตัวบ่งชี้ 1) การกระตุ้นทางปัญญาประกอบด้วย 10 ตัวบ่งชี้ 2) การสร้างแรงบันดาลใจ ประกอบด้วย 11 ตัวบ่งชี้ 3) การคำนึงถึงความเป็นปัจเจกบุคคล ประกอบด้วย 11 ตัวชี้วัดและ 4) การมีอิทธิพลอย่างมีอุดมการณ์ ประกอบด้วย 6 ตัวบ่งชี้ เครื่องมือที่พัฒนาขึ้นสอดคล้องกับข้อมูลเชิงประจักษ์ ($\chi^2 = .452.53$, CMIN/DF =.868, CFI =1.000, GFI= .900, AGFI= .858, RMR=.015, RMSEA= .000, 6)ค่าความเที่ยง หลังการทดสอบความตรงเชิงโครงสร้างของ การกระตุ้นทางปัญญา การสร้างแรงบันดาลใจ การคำนึงถึงความเป็นปัจเจกบุคคลและการมีอิทธิพลอย่างมีอุดมการณ์ คือ 0.93, 0.92, 0.92, 0.87 ตามลำดับและความเที่ยงโดยรวมเท่ากับ 0.97

ตัวชี้วัดที่พัฒนาขึ้น สามารถใช้วัดระดับพฤติกรรมพฤติกรรมภาวะผู้นำการเปลี่ยนแปลงของหัวหน้าหอผู้ป่วยและผู้บริหารทางการพยาบาล ควรนำข้อมูลไปใช้การพัฒนาพฤติกรรมภาวะผู้นำการเปลี่ยนแปลงของหัวหน้าหอผู้ป่วย โดยเฉพาะการสร้างแรงบันดาลใจโดยการทำให้สมาชิกในทีมพยาบาลมองเห็นภาพอนาคตและสื่อสารเกี่ยวกับภาพในอนาคตที่เป็นไปได้

คำสำคัญ: ตัวชี้วัด พฤติกรรมผู้นำการเปลี่ยนแปลง หัวหน้าพยาบาลในโรงพยาบาลเอกชน

INTRODUCTION

The development of leadership skills is very important¹. Transformational leadership is one of the most important types of leadership for nursing organizations². Head nurses who practice transformational leadership act as role models for their staff nurses by gaining their trust and confidence. These head nurses also motivate staff nurses to think differently, seek new opportunities, and find new solutions to existing problems³. Patient satisfaction and hospital performance by nursing staff are higher when the head nurses use a transformational style, serving as role models, mentors, and coaches⁴. In private hospitals head nurses are an important part of the administration. The responsibilities of head nurses are to manage the nurses properly and provide the best quality of care to the patients. And the leadership style of the head nurses has significant effect on the nurse's work outcomes. The development of leadership is very important for leaders¹. In order to understand how nursing leadership affects outcomes, it is important to assess leadership behaviors.

Previous study supporting that the transformational leadership of head nurses is important in the management of the nursing team. The strong relationships between transformational leadership, structural empowerment, and job satisfaction signify that improved healthy

work conditions and environment could be the most important element to improve quality of care and decrease adverse patient outcomes and job effectiveness⁵. Transformational leadership may affect the occurrence of adverse events, since transformational leaders believe in evidence-based work and influence employees to offer innovative ideas to solve the problems⁶. Transformational leaders seek to maximize individuals, groups, organizational development, and innovation⁷. Therefore, head nurses of the private hospitals should use the transformational leadership style⁸.

Transformational leadership has four core components: idealized influence (II), inspirational motivation (IM), intellectual stimulation (IS), and individualized consideration (IC). Idealized influence occurs when transformational leaders serve as role models for their subordinates. Such leaders are admired, respected, and trusted. Inspirational motivation comes from transformational leaders who behave in ways that motivate and inspire those around them, e.g., by providing meaning and challenge to their followers' work. Intellectual stimulation from transformational leaders motivates their team members' efforts to be innovative and creative, to question assumptions, to reframe problems, and to approach old situations in new ways. Transformational leaders provide individualized

consideration and pay special attention to each subordinate's need for achievement and growth by acting as a coach or mentor. The end result is that their subordinates and colleagues develop successively higher levels of potential⁹.

This study measured the transformation leadership style according to "Four I" developed by Bass and Riggio (2006), which was developed from Avolio, B., & Bass, B. (1991). The discussion on the four dimensions related to transformational leadership styles follows. The idealized influence dimension suggests that transformational leaders influence their subordinates by being role models. The inspirational motivation dimension suggests that transformational leaders motivate and inspire their subordinates to complete challenging assignments by sharing their vision and strategies with employees. The intellectual stimulation dimension implies that transformational leaders intellectually stimulate employees to solve challenging problems in a creative manner. Moreover, the individual consideration dimension implies that transformational leaders act as mentors and facilitators for subordinates (Bass & Riggio, 2006)⁹.

Assessment of transformational leadership requires an instrument which includes guidelines of scale. There are eight steps in the process of measurement scale development: identifying the concepts of the variables, defining the concepts, designing a scale, seeking item reviews, conducting preliminary item tryouts, performing field tests, conducting construct validity studies, and evaluating the reliability of the scale¹⁰. Currently there are no instruments available which include indicators of transformational leadership behavior, especially in head nurses of private hospitals in Thailand. The researchers developed and tested a

transformational leadership behavior instrument for head nurses based on Bass and Riggio⁹.

This study was to development of indicators of the transformational leadership behavior of head nurses in private hospitals in Thailand. The developed indicators can be used to measure the behavioral level of transformational leadership behavior of head nurses and used as information to develop transformational leadership behavior of head nurses in the future.

RESEARCH OBJECTIVES

1.To establish and develop indicators of transformational leadership behavior of nursing units in private hospitals in Thailand

2.To assess and validate indicators of transformational leadership behavior of nursing units in private hospitals in Thailand

CONCEPTUAL FRAMEWORK

The indicators of transformational leadership behavior are based on the concepts of Bass and Riggio and are composed of four elements: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. These concepts were used to develop indicators to measure the transformational leadership behavior of head nurses in private hospitals using Burns and Grove's instrument development method to assess and validate the indicators¹⁰. The process included identifying the concepts of the variables, defining the concepts, designing a scale, conducting an item review, conducting preliminary item tryouts and field tests, performing construct validity studies, and evaluating the reliability of the scale.

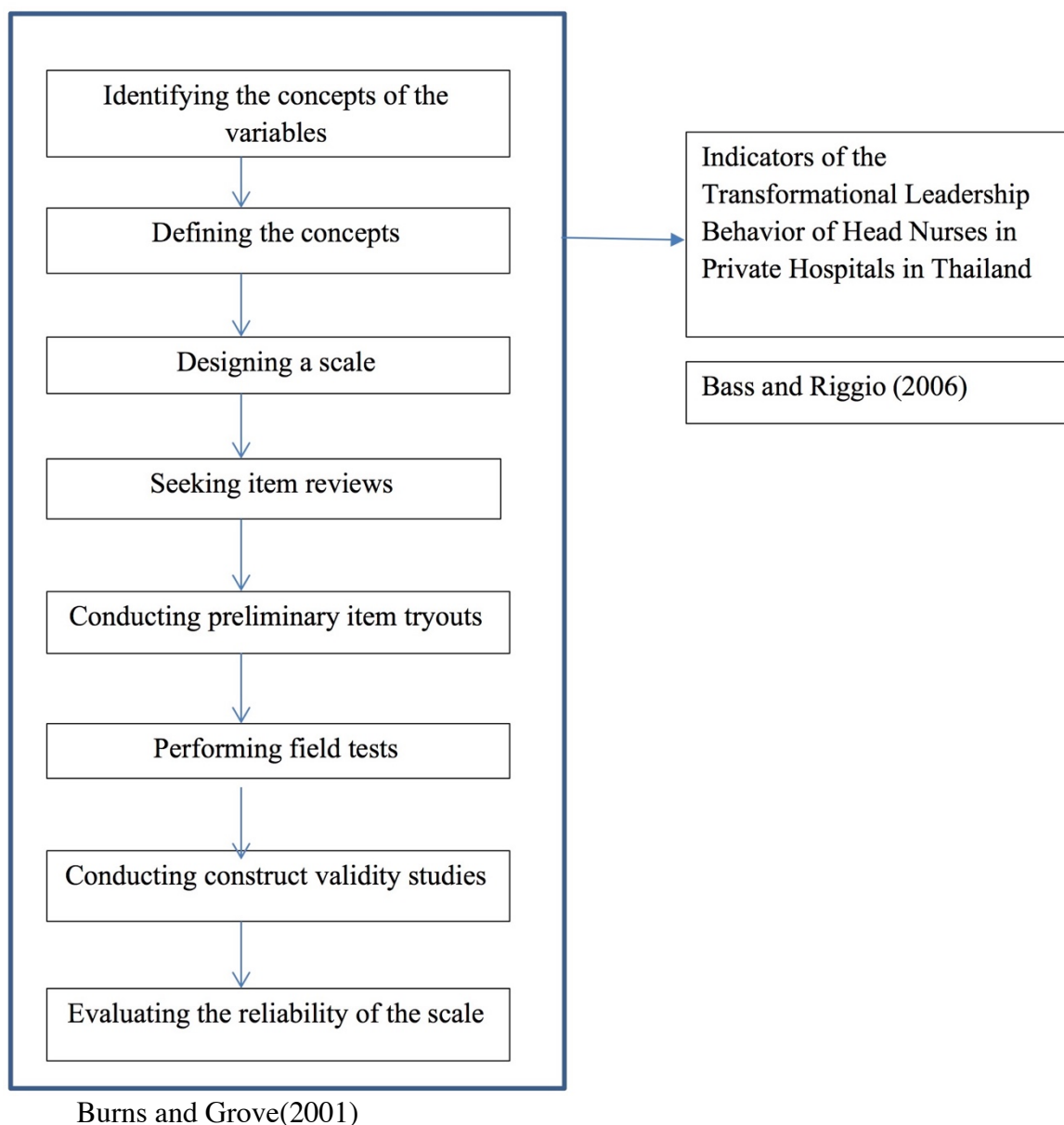


Figure 1: Conceptual framework

METHODS

Population

The population consisted of 1510 head nurses from the large private hospitals nationwide, 133 hospitals by report of Department of Health Service Support at 1 April 2019. The sample was restricted to head nurses who have at

least one years' experience. The sample size is 200 samples, which is enough for fair factor analysis¹¹ and to prevent loss of sample (drop -out rate) and incompleteness of the questionnaire this study increased 20 percent of the sample¹², a total of 250 samples. The Simple random sampling was used by randomly sampling the names of all hospitals by

sampling without replacement and coordinate to inquire about the number of head nurses who meet the Inclusion criteria until receiving the required number of head nurses. There were 25 randomly assigned hospitals in this study.

Indicator development

Development of the indicators involved eight steps: ¹⁰

(1) Identifying the concepts of the variables: This included selecting transformational leadership behavior concepts that could be used in the research and building an understanding of the use of those concepts in practice.

(2) Defining the concepts: Developing an operational definition of transformational leadership behavior of head nurses in private hospitals.

(3) Designing a scale: Designing a scale to evaluate each indicator for measuring performance of transformational leadership behavior of head nurses in large private hospitals in Thailand. The scale had to correspond be consistent with the objectives of the research as well as the content of the items.

(4) Seeking an item review: Having items reviewed by a team of subject matter including experts with knowledge of and experience with transformational leadership behavior of head nurses, expertise in the area of nursing administration, and experts in the field of survey instrument development.

The content validity index (CVI) of the instrument was calculated.

(5) Conducting a preliminary pretest of the items with 30 head nurses¹³ in large private hospitals in Thailand with at least one year's experience in that position, which has the same characteristics as the sample. But not included in the sample group. The reliability of the scale was evaluated by using Cronbach's alpha coefficient to obtain a measurement of internal consistency of the overall scale, each component's reliability, item-total correlations, item-item correlations, and alpha if item deleted reliability coefficients.

(6) Performing field tests: The field test sample in this study was composed of 205 head nurses in large private hospitals in Thailand who had at least one year's experience in managing nursing units in large private hospitals.

(7) Conducting construct validity studies: Following collection of data from head nurses at their hospitals, statistical data analysis was conducted using confirmatory factor analysis.

(8) Evaluating the reliability of the scale: Validity testing can result in a reduction in the number of items, so the collected data were again analyzed for reliability. The initial reliability analysis could not be used because the remaining components constituted a distinct set of items.

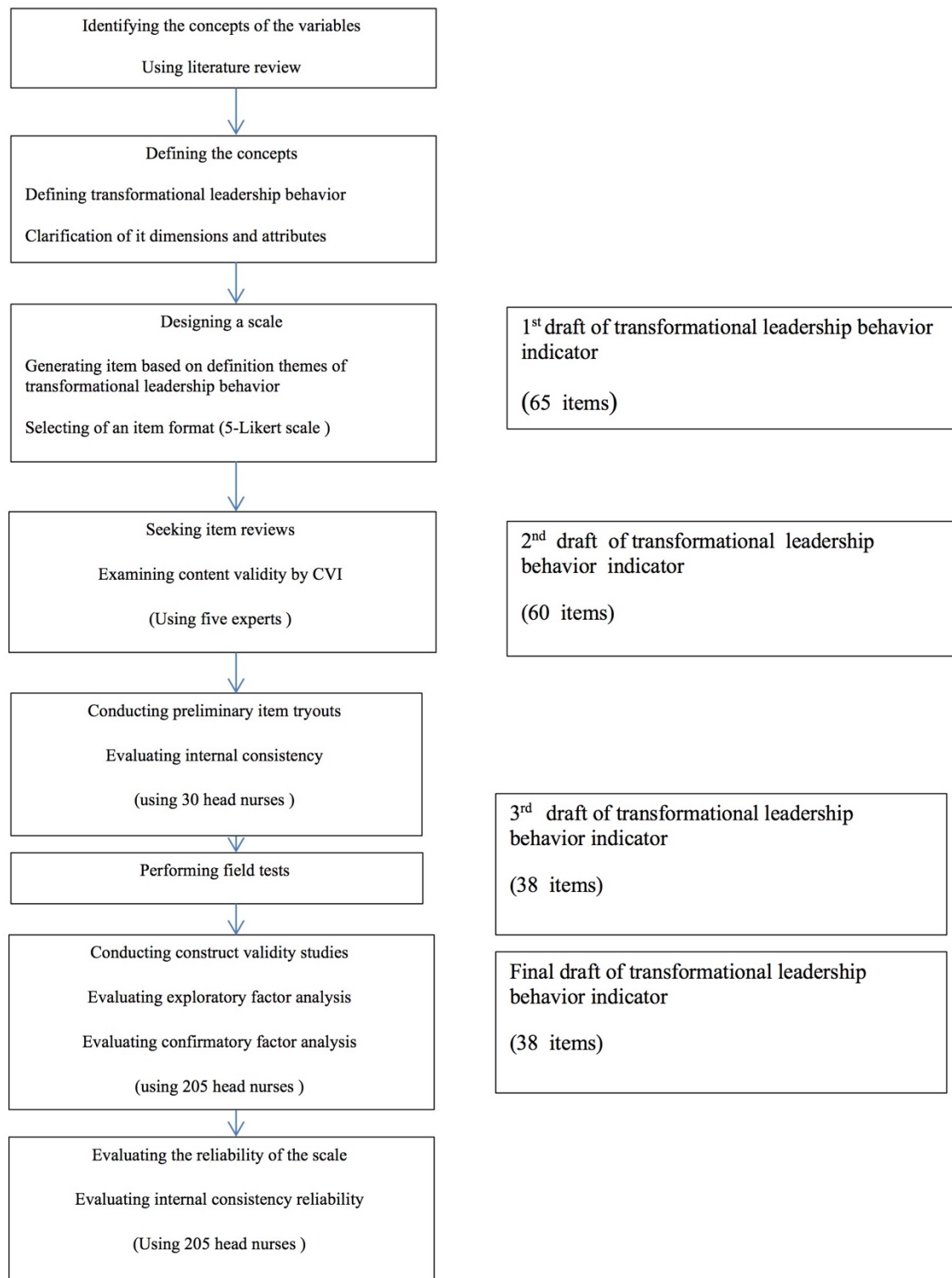


Figure 2: Steps of indicator development

Data analysis

The data were analyzed using the following statistical methods:

1) Descriptive statistics were used to determine means and standard deviations.

2) Exploratory factor analysis was used to organize components of transformational leadership behavior.

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.

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

Ethical considerations

The Ethical Committee of the Christian University of Thailand approved this study (registration no. N.16/2561) on April 4, 2019, and permission was obtained from the directors of the private hospitals in Thailand where the data was collected. Each participating head nurse was informed about the purpose and benefits of the study and 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 coded to maintain participant confidentiality. Informed consent forms that contain names or other personal identifiers will be stored separately. From the questionnaire and identified by code number. All databases will be secured with password-protected access systems. The findings were presented from an overall perspective, and the participants had the right to cancel participation in the study at any time without any impact

on participants. Implied consent was made if they were willing to complete and return the questionnaires to the researchers.

RESULTS

Two hundred five head nurses in private hospitals in Thailand responded to the self-administered questionnaire. Most were female (99%) and aged 41-50 years (48.8%). Most had a bachelor's degree (88.8%) and more than five years' experience as a head nurse (57.6%). The indicators were developed as follows. The first step was identifying transformational leadership behavior concept variables for head nurses and developing an understanding of the relevant details following Bass and Riggio's transformational leadership behavior concepts⁵. The second step was to operationally define "transformational leadership behavior" from the perspective of the head nurses of the nursing units. This step involved the creation of 60 indicators for the four components. The components consisted of Idealized Influence (16 indicators), Inspirational Motivation (19 indicators), Intellectual Stimulation (12 indicators), and Individualized Consideration (13 indicators).

In the third step, a 5-point Likert scale was used to measure each of the transformational leadership behavior indicators. Anchor points for the scale were "strongly agree", "agree", "moderately agree", "disagree" and "strongly disagree"¹⁴. In the fourth step, content of each item was selected to correspond with the research objectives. The items selected were then reviewed by five experts¹⁵: two head nurses with private hospital experience, one expert in the field of instrument development, and two experts in the field of nursing administration. The item review obtained a content validity index (CVI) of 0.95. It

was accepted. Questionnaires with excellent content consistency have a CVI of 0.9 or higher¹⁶.

In the fifth step, a preliminary trial of the items was conducted with 30 head nurses from large private hospitals in Thailand with least one year's experience in the head nurse position. These data were used to calculate the reliability of the instrument's components using Cronbach's alpha coefficient. The internal consistency of the components were, Idealized Influence 0.93, Inspirational Motivation 0.96, Intellectual Stimulation 0.93, and Individualized Consideration 0.96. The overall reliability was 0.98. The reliability of items is acceptable if the alpha is within .70 and .99¹⁷. The corrected item-total correlation was 0.37-0.84. And all of the alpha if an item was deleted ranged was 0.98, indicating satisfactory internal consistency. In the sixth step, testing of the measure was performed at field tests field tests of the instrument were conducted with head nurses of nursing units in large private hospitals in Thailand. The sample was randomly selected by stratified random sampling and simple random sampling of head nurses who had at least a year experience in the position. Of 250 questionnaires distributed, received back 236 questionnaires after the examination is complete, 205 questionnaires (82%). The response rate was good to very good, more than 75 percent¹⁸. Statistical analysis was conducted using exploratory factor analysis and confirmatory factor analysis.

Data suitability was tested with the conditions of statistical data analysis.

Factor analysis using Bartlett's test of sphericity was statistically significant (P-value < 0.01) and the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was 0.94, indicating the variables were related. The data had high suitability for analysis using factor analysis statistics¹². Construct validity was determined through exploratory factor analysis, extracting components by principle component factor analysis, and using orthogonal rotation toward simple structure using the Varimax method. The relevant component selection criteria consisted of considering factors with Eigen values exceeding 1.00 with component explanations for four indicators. In addition, each indicator had a factor loading of 0.40 or more¹⁹.

From the factor analysis, transformational leadership behavior was found to have 38 indicators for the four components. The components of transformational leadership behavior consisted of ten indicators in the area of intellectual stimulation, eleven indicators in the area of inspirational motivation, eleven indicators in the area of individualized consideration and six indicators in the area idealized influence. Of the total variance, 60.25% was accounted for by the factors. All the factor loadings of the transformational leadership behavior indicators were in a positive range: intellectual stimulation indicators were 0.449- 0.811; the range for inspirational motivation indicators was 0.532-0.690; for individualized consideration was 0.444-0.676 and for idealized influence indicators ranged from 0.508-0.826.

Table1 : Eigenvalues, percentage of variance, percentage of accumulated variance and number of indicators of each component of the transformational leadership behavior of head nurses

Component name	Eigen value	Percentage of variance	Percentage of accumulated variance	Number of indicators
Intellectual stimulation	17.09	44.98	44.980	10
Inspirational motivation	2.384	6.274	51.253	11
Individualized consideration	1.957	5.151	56.405	11
Idealized influence	1.462	3.846	60.251	6

Confirmatory factor analysis was used to test whether data fits a measurement how well the data fit the model of factors and their indicators, i.e., to test whether 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, that is, the fit between the actual data and the hypothesized model. Tests included chi-square goodness 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).

Confirmatory factor analysis found the transformational leadership behavior model was consistent with the evidence-based data and that the research model fitted 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 ²⁰	Confirmatory factor analysis level 1	Confirmatory factor analysis level 2
χ^2 - test	$.05 < p \leq 1.00$	P=.989	P=.986
CMIN/DF	$2 < \chi^2 / df \leq 3$.863	.869
Comparative fit index (CFI)	$.95 \leq CFI < .97$	1.000	1.000
Goodness of fit index (GFI)	$.90 \leq GFI < .95$.902	.900
Adjusted goodness of fit index (AGFI)	$.85 \leq AGFI$.860	.858

Goodness of fit indices	Acceptable Fit²⁰	Confirmatory factor analysis level 1	Confirmatory factor analysis level 2
Root mean square error of approximation (RMSEA)	$.05 < \text{RMSEA} \leq .08$.000	.000

The result of factor score was Analysis of the factor scores found the component with the highest overall factor loading was administrative potential of transformational leadership followed by inspirational motivation, intellectual stimulation, individualized consideration and idealized influence (Tables 3 and 4).

Table 3 : Factor loadings of transformational leadership behavior indicators.

Observed Variable	Factor Loading
Idealized Influence	0.839
TLII 03. Admired by the team members	0.695
TLII 04. Respected by the team members	0.701
TLII 05. Trusted by the team members	0.600
TLII 06. Proud to be a head nurse	0.742
TLII 07. Special ability accepted by team members	0.659
TLII 11. Building confidence to help the team achieve goals	0.722
Inspirational Motivation	0.932
TLIM 17. Made work responsibilities meaningful	0.650
TLIM 19. Challenge to their followers' work	0.643
TLIM 20. Developing team spirit	0.702
TLIM 22. Enthusiasm Expressing enthusiasm	0.636
TLIM 29. Encouraging optimism	0.674
TLIM 30. Using positive communication about future goals	0.666
TLIM 31. Communicating the benefits of work to achieve goals	0.673
TLIM 32. Making Helping nursing team members see the future	0.806
TLIM 33. Talking about possible future images conditions	0.789
TLIM 34. Envisioning attractive future states	0.741
TLIM 35. Clearly stating expectations	0.723
Intellectual Stimulation	0.926
TLIS 36. Solving problems by questioning assumptions	0.740
TLIS 37. Reframing problems	0.765
TLIS 38. Looking at various aspects of problems	0.768
TLIS 39. Solving the same problem with old problems using new methods	0.784
TLIS 40. Approaching old situations in new ways	0.796
TLIS 41. Supporting the creativity of members of the nursing team	0.724
TLIS 42. Encouraging creative thinking in solving problems	0.724
TLIS 44. Encouraging proposing new ideas for problem solving	0.737
TLIS 45. Encouraging proposing new solutions	0.769

Observed Variable	Factor Loading
TLIS 46. Encouraging trial testing to solve problems	0.747
Individualized Consideration	0.866
TLIS 48. Acting as a coach or a consultant	0.633
TLIS 50. Advising or coaching individually	0.659
TLIC 51. Creating an atmosphere that encourages team members to develop their own potential	0.834
TLIC 52. Accepting the existence of different needs	0.717
TLIC 53. Accepting individual differences	0.758
TLIC 54. Treating each member of the team with regard to individuality as an individual	0.692
TLIC 55. Encouraging two-way communication exchange	0.773
TLIC 57. Engaging in management by walking around	0.640
TLIC 58. Directing support to work in accordance with guidelines	0.590
TLIC 59. Providing opportunities by assigning tasks	0.687
TLIC 60. Evaluating work in a way that encourages team members	0.707

Table 4 : Factor loadings of transformational leadership behavior indicators and coefficient of determination (R^2) of the four components

Component	Factor Loading	R^2
Inspirational Motivation	0.932	0.869
Intellectual Stimulation	0.926	0.857
Individualized Consideration	0.866	0.750
Idealized Influence	0.839	0.704

In the eighth step, the reliability of the scale was evaluated. Collected data should be analyzed for reliability following construct validity because there may be fewer total items. Data was reanalyzed for reliability following construct validity because the number of items had been reduced. The reliability of the components was analyzed using Cronbach's alpha coefficient. The internal consistency of the components was Intellectual Stimulation 0.93, Inspirational Motivation 0.92, Individualized Consideration 0.92 and Idealized Influence 0.87; the overall reliability was 0.97. The corrected item-total correlation was 0.37-0.84; and overall of the alpha if an item was deleted ranged was 0.97, showing that the scale's internal consistency value was satisfactory.

DISCUSSION

According to the instrument developed by Burns and Grove (2001), good indicators should have internal consistency, i.e., each question in the instrument should measure the same characteristics, inter-item correlations should be 0.30 to 0.80 ²¹ and Cronbach's alpha coefficient for the components should be .70 or above ²². The indicators of transformational leadership behavior in this study are based on Bass and Riggio (2006) and focus on transformational leadership behavior of head nurses in private hospitals. The content of the indicators was validated by five experts. Indicators of transformational leadership behavior after construct validity had a Cronbach's alpha coefficient of 0.93 for the Intellectual Stimulation component, 0.92 for the Individualized Consideration

component, 0.92 for the Inspirational Motivation component, and 0.87 for the Idealized Influence component. The overall Cronbach's alpha coefficient was 0.97 and internal consistency based on inter-item correlations was 0.26-0.84. The construct validity test results of the performance indicators of transformational leadership behavior of head nurses in private hospitals included four components and 38 indicators. Indicators of transformational leadership behavior had very good internal consistency and were congruent with empirical data. The chi-square test was 452.534 with $df = 521$, $p = 0.986$, the goodness of fit index (GFI) was 0.900, the adjusted goodness of fit index (AGFI) was 0.858, and the root mean square error of approximation (RMSEA) was 0.000. This is the process of validation research instruments, able to define the constructs of valid items and provide a clear definition of the measurable constructs that are consistent with theoretical expectations. This indicator can be effectively used on items that can be measured consistently and used for valid response patterns. The findings satisfied the research instruments that fit the model.

The indicator of transformational leadership behavior had acceptable reliability for assessing the construct of transformational leadership behavior. The construct indicators of transformational leadership behavior of head nurses in private hospitals in this study were composed of four components: idealized influence intellectual stimulation, inspirational motivation, individualized consideration and the developed instrument, congruent with empirical data as described by Bass and Riggio⁹ The construct differs from the transformational concept of Yaghoubi, Mahallati, Moghadam & Fallah (2014)¹ which

divided transformational leadership into five components: idealized influence intellectual stimulation, inspirational motivation, individualized consideration and vision explanation. In the present study, the idealized influence and vision explanation components were combined into one component, but the overall transformational concept is not significantly different from the five-component model. The indicator is also effective and appropriate for measures transformational leadership behavior.

Based on factor loading, inspirational motivation was a highest level which the most important factor, similar to the findings of the Khuangporn (2016)²³ study of the development of a 21st century transformational leadership scale for undergraduate students, and the findings of Leonard Ngaithe, Aol, Lewa, and Ndwiga (2016)²⁴ that inspirational motivation has a significantly greater positive effect on staff performance of commercial and strategic state. In private hospitals, the head nurse must inspire the team to create jobs that meet their goals. Staff on the nursing team needs support and acceptance from the people around and head nurse. When staff in the team or in the organization is inspired to work together the organization's portfolio will quickly reach its goals, which the results of this study correspond to the private hospital's context.

CONCLUSIONS

The indicators of transformational leadership behavior have good construct validity and accuracy and are consistent with the four main components of Bass and Riggio's transformational leadership behavior concept. These indicators developed can be used to measure are suitable for measuring levels of transformational leadership.

RECOMMENDATIONS

These indicators could be used by nursing units in private hospitals in Thailand to measure transformational leadership behavior of head nurses in hospitals; results of such studies could help create guidelines for developing programs to promote transformational leadership behavior in head nurses.

LIMITATION

The main limitation of this study is that the results obtained may not be generalizable to every size of the hospital and in the present research questionnaires were distributed among 205 head nurse over a 4-month period. More accurate results can be obtained by extending the period and selecting a larger number of employees as subjects.

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