

Scale Development for Innovation Performance in Nursing Organizations of Community Hospitals under the Ministry of Public Health in Thailand

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Abstract

Measurement of innovation performance of nursing organizations is required for development and competition; however, there is a lack of reliable measurement scales. Thus, the aim of this quantitative research was to develop a measurement scale for innovation performance of nursing organizations. The 8-step process of scale development based on DeVillis, 2012 was employed. Question items about three factors (11 indicators) were written from definitions of terms. The content validity index (CVI) was 0.98; the reliability of the three factors: process innovation, service innovation, and administrative innovation was 0.93; and exploratory factor analysis was used to evaluate construct validity. The study was conducted with 340 heads of patient care units of community hospitals. The result of the study was a measurement scale for innovation performance of nursing organizations in community hospitals consisting of three innovation factors and 11 indicators as follows: 1) Process innovation with 3 indicators; 2) service innovation with 4 indicators; and 3) administrative innovation with 4 indicators. The eigenvalue was 8.69; the percentage of variance = 80.35, the KMO value = 0.93, and the p value = <0.05. The results of the study indicate that development of a measurement scale for innovation performance of nursing organizations is necessary for decision-making on progress planning and forming strategies for driving innovation performance of nursing organizations in community hospitals under the Ministry of Public Health.

Keywords: *Innovation Performance, Nursing Organization, Scale Development*

Introduction

Innovation is important to help organizations survive the rapidly changing global society. Especially the government organizations was limit with budget constraints, so that innovation can help the ability to competitive advantage.¹ Innovation is involved and can improve the quality of services and also increase the capacity to solve problems of government organizations in dealing with the challenges of a changing global society.² Therefore it is necessary to have an innovation performance, because innovation performance can balance the cost and quality of nursing services.³⁻⁴

Innovation performance is important that will result in the performance of the organization covering efficiency, effectiveness, quality of service, growth development and leaning.⁵ The Organization for Cooperation and Global Economic Development.⁶ states that innovation performance is a focus on the process of various factors in the production of innovation and focusing on the results of innovation activities. The focus on organizational innovation success includes the ability to create new things, new ideas, new processes and a new invention that can be applied to the real value and effectiveness of the organization.⁷

The literature review of research reports about innovative performance measurement tools in nursing organizations in foreign country and Thailand. Most of the research results are studies in the business sector, quite a few government sectors but there are no studies on innovative performance measurement tools in the health organizations and nursing organizations. This research therefore needs to develop an innovation performance measurement tool in an organization. In accordance with the context of the nursing organization Community hospital Under the Ministry of Public Health To be used in evaluating the performance of nursing organizations in the future.

Purposes

The objectives of this research were:

1. To establish and develop performance indicators of innovation performance of community hospitals under the ministry of public health.
2. To assess and validate the performance indicators of innovation for the heads of patient care units of community hospitals under the ministry of public health.

Method

The aim of this quantitative research was to develop a measurement scale for innovation performance of nursing organizations

Population and sample

The population consisted 2962 heads nurse of patient care units of community hospitals under the ministry of public health., 694 hospitals. The sample was restricted to heads nurse who have at least one years' experience. The sample size was calculated using Krejcie & Morgan formular. A stratified random sampling was used by sampling from the community hospital, and simple random sampling and sample size calculation resulted in 340 head nurses from 81 community hospitals.

Indicator development

Development of the indicators involved 8steps by DeVellis⁸ :

(1) Identifying the concepts of the variables. Selecting innovation performance concepts that could be used in the research and building an understanding about these concepts in use.

(2) Defining the concept. Defining an operational definition of innovation performance in nursing organization of community hospitals under the ministry of public health.

(3) Designing of a scale. Designing a scale to be used to consider each indicator for measuring innovation performance for nursing organization in community hospitals under the ministry of public health. The scale must correspond with the objective of the research and content of the items.

(4) Seeking item review. Seeking item review from a team of subject matter experts with knowledge and experience in innovation of nursing organization, expertise in the area of nursing innovations, and with at least three experts in the field of survey instrument development. Content validity index (CVI) were analyzed.

(5) Conducting preliminary item tryouts. Conducting a preliminary pretest of the items with 30 head nurses of patient care units who have had at least one years of innovation experience in nursing organization at community hospitals. Data were used to calculate indicators reliability by using Cronbach's Alpha Coefficient to obtain 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 sample group in this study was composed of 340 head nurses of patient care units in nursing organization of community hospitals, based on the concept of DeVillis.

(7) Conducting construct validity studies. Having collected data from head nurses of patient care units in nursing organization of community hospitals under the ministry of public health whose duties involving the innovations in nursing units, conducting statistical data analysis by performing explanatory factor analysis

(8) Evaluating the reliability of the scale. After construct validity, the collected data should be analyzed for reliability one more time, because there may be fewer items, and therefore the previous reliability analysis cannot be used with components consisting of a distinct set of items.

Result and Discussion

The results of this study are presented with the steps in the development of the indicators as follows:

The first step was identifying concepts of the variables of innovation performance in nursing organization health community hospital nursing units, and building an understanding about the details from A systematic review by Vries, Bekkers, Tummers, with combined Damanpour,^{2,9}. The second step operationally defined innovation performance in a way that could be used to measure innovation performance from the perspective of the head nurses of patient care units. This involved creating 16 indicators of 3components. Each of the components consisted of the following: 1) process innovation (3 indicators), service innovation (4 indicators), and 3) administrative innovation (4 indicators). In the third step a measurement scale was designed in the form of a 5-point Likert scales that would be used to consider each of the indicators for measuring nursing unit innovation performance. Anchor points for the scale had labels ranging from “most real”, “real”, “not sure”,

“unreal” and “most unreal”. Item content for the scales was selected that corresponded to the objective being studied by the researcher and the indicators.

Pursuant to the fourth step, item review was sought from five subject matter experts. Item reviews obtained a content validity index (CVI) of 0.98. In the fifth step a preliminary try out of the items was conducted with 30 head nurses of patient care units who had at least one years of innovation experience in nursing units of community hospitals. Data were used to calculate the instrument’s components reliability by using Cronbach’s Alpha Coefficient. The internal consistency of the input to the process innovation component was 0.93; the service innovation component was 0.93; the administrative innovation was 0.93. The corrected item-total correlation was at 0.30 – 0.76. The item-item correlation matrix was at 0.30- 0.70 for more than 50% of the correlations, and the alpha if item was deleted ranged from 0.8- 0.9, showing that the scale’s internal consistency value was at a satisfactory level.

In the sixth step, testing of the measure was performed at field tests with head nurses of nursing units of community hospitals under the ministry of public health. The sample group was randomly selected by stratified random sampling and simple random sampling by listing each community hospital for a non-displacement proportionally, and the collection of data from head nurses in nursing units for at least one years. Researchers were able to collect data from 305 completed forms out of 340 sent out (89.70%), and to conduct statistical data analysis by performing explanatory factor analysis. In the seven step, the exploratory factor analysis of indicators for measuring innovation performance of nursing units was conducted as follows: Data suitability was tested in line with the conditions of statistical data analysis. Factor analysis found significant Bartlett’s Test of Sphericity (P-value < 0.01), the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of 0.93, meaning the variables were related. The data had high suitability for analysis using factor analysis statistics. Construct validity was determined by performing exploratory factor analysis, extracting the components by principle component factor analysis, and using orthogonal rotation to simple structure by the Varimax method.

The relevant component selection criteria consisted of considering factors with Eigenvalues exceeding 8.69 with component explanations for three indicators and up. In addition, each indicator had a factor loading of 0.50 and up. According to the exploratory factor analysis, the innovation performance indicators of nursing units had 11 indicators for the 3 components. The components of the process innovation consisted of three indicators 2) four indicators in the service innovation and 3) four indicators in the administrative innovation. The percentage of total variance accounted for by the factors can be explained at 80.35 percent (see table 1). The factor loadings of the innovation performance indicators of nursing units are organized from high to low as shown, the process innovation indicators were in a positive range from .79 to .81 with a statistical significance of .01 for all of them; the service innovation indicators were in a positive range from 0.57- 0.80 with a statistical significance of .01 for all of them; and the administrative innovation indicators were in a positive range from 0.70- 0.85 with a statistical significance of .01 for all of them (see table 2).

Table 1: Eigenvalues, percentage of variance, percentage of accumulated variance, and number of indicators of each component of performance indicators of innovation performance.

Component name	Eigen value	Percentage of variance	Percentage of Accumulated variance	Number of indicators
Process innovation	8.68	66.75	66.75	3
Service innovation	1.17	9.01	75.76	4
Administration innovation	1.00	4.59	80.35	4

Table 2: Factor loadings of performance indicators of innovation performance for nursing organization

No.	Indicators	Factor loading
Process innovation		
1	There are performance in applying new technologies for improving patient care processes.	0.81
2	There are a change in working procedures, new process, new tool or new concepts to continuously improve the quality of nursing services.	0.81
3	There are performance, response to the needs of users that have changed dramatically.	0.79
Service innovation		
1	There are results of continuous development of new services.	0.57
2	There are results from the commitment to recommend and distribute new services according to the needs of users in all departments.	0.65

3	There are results from the promotion of expertise in the provision of nursing services.	0.80
4	There are performance resulting from the use of new concepts / new technology / to provide nursing services.	0.70
Administrative innovation		
1	There are performance results from supervisors are managed with new concepts, new methods are continuing.	0.70
2	There are a performance evaluation when job improvement with new management innovations continuously.	0.73
3	There are resulting in personnel being able to communicate in modern two-way administration.	0.85
4	There are a result of the development of management innovation by using as a basis for considering the performance of personnel in the department.	0.81

Future to the eight steps for evaluating the reliability of the scale. The data was tested by determining the internal consistency of 11 innovation performance indicators of nursing units. Cronbach's Alpha Coefficient for the entire set after construct validity analysis was at 0.951. Cronbach's Alpha Coefficient in each component was at 0.93.

Conclusion

The results of the study indicate that development of a measurement scale for innovation performance of nursing organizations is necessary for decision-making on progress planning and forming strategies for driving innovation performance of nursing organizations in community hospitals under the Ministry of Public Health in Thailand

Implication

The head nurses of patient care units of community hospitals under the ministry of public health can implement innovation performance programs base on the indicators developed in this study to measure the innovation performance of in nursing organization. Furthermore, the findings can to be used to policy formulation and strategic planning to innovation management at the level of heads nurse in organization in community hospitals under the ministry of public health, Thailand.

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