Validity and Reliability of the Nurse Manager Performance Assessment Scale

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ABSTRACT

Background: The performance of nurse managers is significantly important in providing quality and safe patient care services in hospitals, as well as in retaining the nurse workforce.

There are limited number of measurement instruments for which validity and reliability have been tested in order to assess nurse managers' level of performance.

Objective: This study was conducted to examine the psychometric testing of the "Nurse Manager Performance Assessment Scale," which is used to assess the annual performance of nurse managers working in a private chain hospital group in Turkey.

Method: The sample of this methodological study was composed of 165 nurse managers. The data were obtained from the Hospital Information Management System, retrospectively. Results: The average score of the eight-item scale items ranged between 3.3 (0.8) and 3.7 (0.8). The Cronbach's alpha coefficient, indicating the internal consistency, was found to be 0.943, while the Spearman-Brown coefficient, indicating intraclass consistency, was found to be 0.910. The two-factor scale obtained using exploratory factor analysis was examined using confirmatory factor analysis and the model was found to be significant.

Conclusion: In this study, the results of psychometric analysis of the "Nurse Manager Performance Assessment Scale," which is used to assess the annual performance of nurse managers, indicated that the scale is a valid and reliable instrument. It is recommended that the scale be applied in different institutions and that it be tested in practice based on pilot application results.

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1.INTRODUCTION

Today, competition is increasing in healthcare services, as in other sectors. In this context, the delivery of quality and safe services in hospitals is a high priority issue (Gunawan & Aungsuroch, 2017; Güdük & Önder, 2020; Sivey & Chen, 2019). Employees of the department of nursing services, who constitute approximately half of the medical team members providing direct service for patients in hospitals, are the backbone of the organization in ensuring the achievement of corporate quality and patient safety goals (Ekici & Türkmen, 2020; Needleman & Hassmiller, 2009; Phillips et al., 2021). Previous studies emphasize the critical importance of the roles of unit nurse managers in the effective and efficient provision of health services (El Haddad et al., 2022; Giesbers et al., 2021; Nurmeksela et al., 2021).

Unit nurse managers play a key role in the training and professional development of employees, workforce retainment, employee motivation, giving of feedback, employees' approach to corporate goals, and thus the achievement of both institutional outcomes and increase in employee and patient satisfaction (Alsadaan et al., 2023; Giesbers et al., 2021; McConnell et al., 2014; Needleman & Hassmiller, 2009). A systematic review study, which is on impact of nurse leaders behaviours related to nursing staff performance, showed that factors influencing nurses' motivation to perform better were found including autonomy, competencies, relatedness, individual nursing characteristics, relationships and support, and leadership styles/practices of nurse managers (Alsadaan et al., 2023). In another study, it is emphasized that there is a relationship between positive nurse manager style and the work engagement of staff nurses (Alluhaybi et al., 2023). However, in order to ensure that nurse managers carry out this role effectively, they are also required to have the necessary competencies and a high level of job performance. Therefore, measurement of their level of performance is considered necessary (Liou et al., 2021; Liou et al., 2022).

Along with other health managers, nurse managers are expected to integrate modern business management knowledge and applications through professional practices (AONE, AONL, 2015a, 2015b). Because the role of nurse managers changed from clinical focus to managerial focus in healthcare organizations. There is a need to apply their managerial functions by nurse managers (Gunawan & Aungsuroch, 2017). Several studies in the literature define nursing competency areas (AONE, AONL, 2015a, 2015b; McConnell et al., 2014), and some researchers have developed instruments in order to identify these areas (Liou et al., 2021; Sökmen, 2005).

The American Organization of Nurse Executives (AONE) defined necessary nursing competencies in 2005, updated these competencies in 2015, and classified them under three main headings regarding unit nurse managers and five regarding nurse executives (AONE, AONL, 2015a, 2015b). The competencies for unit nurse managers are listed as follows: “The Science: Managing the Business,” “The Art: Leading the People,” and “The Leader Within: Creating the Leader in Yourself" (AONE, AONL, 2015a). These competencies, which is updated by AONE-AONL in 2022, and provide the framework for making effective leadership across all level nurse managers (AONE, AONL, 2022).
A study by Liou et al. (2021) divided the essential competencies of nurse managers into four groups: “leadership,” “business management,” “integrative skills,” and “communication and relationships.” Gunawan & Aungsuroch (2017) identified managerial competence of first-line nurse managers which are developing self, planning, organizing, leading, managing legal issues, managing ethical issues, and delivering health care as in internal and external factors. A study by Sökmen (2005) divided these competencies into three groups: "general unit management,” “personnel management,” and care management.” Additional studies have been conducted with the aim of improving the managerial competencies of nurse managers or those who are candidates for management positions (Goktepe et al., 2018; Kim & Lim, 2022; Patton et al., 2013; Titzer et al., 2014).

The performance of nurse managers in health institutions is measured and assessed by executive nurses. However, previous studies have shown that measurement instruments designed to assess nurse managers' competencies were based on self-assessment (Sökmen, 2005) or were used in order to identify areas of competency (Liou et al., 2021). To the best of our knowledge, there are no empirical studies that have longitudinally examined the measurement and assessment of nurse managers' level of performance.

This study was conducted in order to examine the psychometric testing of the measurement instrument prepared by the Human Resources Department in a private hospital chain; the instrument was designed to measure and assess the managerial performance of department/unit managers. The effective measurement of nurse managers' level of performance using a valid and reliable instrument may contribute to the functioning of the institution and nursing services by improving job motivation and performance through determining the requirements related to employee training and development, providing feedback, and ensuring the achievement of corporate goals.

2. MATERIALS AND METHOD

Study design and setting

This methodological study was conducted in a private chain hospital group in Turkey. In the institution, with which 16 hospitals are affiliated, there were total 16 executive nurses. Executive nurses had received training in the use of the managerial performance assessment tool designed by the Human Resources Department. The performance assessment process of the each hospital's unit nurse managers was carried out by an executive nurse. For this purpose, a comprehensive performance assessment interviews using the "Nurse Manager Performance Assessment Scale" were held every three months and at the end of the year by the executive nurses with the unit nurse managers. In the interview held at the end of the year, the performance score was obtained using the hospital information system (a five-point Likert-type scale) for each unit nurse manager. During the regular and end-of-year performance interviews, the executive nurses gave feedback to their unit nurse managers based on the criteria in each performance area, discusses strengths and areas for potential improvement, and supports to create their action plan. Necessary measures were taken to conduct an efficient performance interview. Such measures included scheduling an appropriate time for the interview, providing an environment suitable for open communication, giving behavior-focused feedback, adopting a constructive and supportive approach, providing learning and development opportunities, preparing an action plan for behaviors that could be improved, and setting clear goals. Executive nurses followed up each action plan established during the performance interviews and perform assessments by conducting midterm interviews as necessary.

Population and sampling

The data were collected retrospectively. The research universe was composed of unit nurse managers (N: 269) working in the inpatient or outpatient units of 16 hospitals affiliated with the Acıbadem Health Group, where the study was conducted. In scale development studies, it is recommended that the sample number be at least 3 to 20 times the number of items (Gunawan, et al., 2021). In this study, the scale contained eight items, and the sample size was more than 20 times that number. Those who (a) had worked at least one year in inpatient or outpatient units/departments between 2017 and 2018, and (b) had been assessed for the first time by the executive nurses, were included in the sample. The study was conducted with a total number of 165 unit nurse managers.

Data collection tool and ethical considerations

Ethical approval was granted by the Medical Research Evaluation Committee of a university (2022-01/43), and institutional permission was obtained from the X Group. The data were obtained retrospectively using the Hospital Information Management System. No personally identifiable data were included in the data collection form, and the data were obtained by processing it into an Excel database prepared by two researchers. The data collection form consisted of two parts: the demographic and professional characteristics of the nurse managers, and the managerial performance assessment scale. The former included age, gender, retirement status, marital status, educational background, location of the hospital they were currently working in, duration of professional experience before the current hospital, and duration of professional experience in the current hospital.

Nurse Manager Performance Assessment Scale: This instrument was prepared by the "Expert Group" in the Human Resources Department in order to be used by a senior manager to assess all unit managers, including nurses working in the chain hospital group. The instrument consists of eight items and 43 criteria. These items are: "Setting a goal (Determination of department objectives that will support the achievement of the institution's vision, 6 criteria)," "Determining the method (Planning the tasks that need to be performed in order to achieve the department's goals, taking into account the priorities of the institution, 7 criteria)," "Preparing required resources (Creating the necessary arrangement and preparing the necessary resources with which to execute the plan, 4 criteria)," "Track and control (Providing the necessary guidance and support with which to achieve the goals, 4 criteria)," "Improving efficiency and productivity (Regular evaluation of the effectiveness and efficiency of practices and creating development opportunities (3 criteria)," "Management of external partners' relations (Working with partners outside of the team, including the first manager, managers of cooperating teams, key customers to whom services are offered, and key suppliers from which services are received; establishment and effective management of relationships, 5 criteria)," "Team management (Effective management of relationships with team members, 5 criteria)," and "Self-management (Effective management of personal impact and image by demonstrating and developing the necessary knowledge/skills, 9 criteria)." Exce use the 5-point Likert-type scale based on scores ranging from "1-Extremely below expectations," "2-Needs improvement," "3-Successful/fulfilling the tasks properly," "4-Very successful," and "5-High-achieving." A single performance score ranging between 1 and 5 is obtained by averaging all the items.

Data Analysis

The Statistical Package for Social Science Version 26.0 (SPSS) and AMOS 22 were used for data analysis. The demographic and professional characteristics of the participants and average scale scores were analyzed using descriptive statistics (number, percentage, mean, and standard deviation). The Cronbach's alpha was used for internal consistency, and the Spearman-Brown correlation and Split-half method were used for intraclass correlation. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed to achieve construct validity.

3. RESULTS

Descriptive characteristics of the participants

The data obtained from 165 participants, who were selected among unit nurse managers in the hospital information management system and who met the sampling criteria, were analysed. The demographic and professional characteristics of the participants are shown in Table 1..

Table 1. Participants' demographics and professional characteristics

Variables		Mean	SD
Age		38.6	6.4
		n	**%**
Gender	Male	25	15.2
	Female	140	84.8
Retirement status	Employed	160	97.0
	Retired	5	3.0
Marital status	Single	63	38.2
	Married	102	61.8
Educational background	Postgraduate	36	21.8
	Bachelor's degree	71	43.0
	Associate degree	11	6.7
	High school	47	28.5
Location of the hospital	Istanbul	107	64.9
	Other cities	58	35.1
Duration of employment before the current hospital	<1 year	30	18.2
	1-3 years	20	12.1
	>3 years - ≤ 5 years	17	10.3
	> 5 years	43	26.1
	None	55	33.3
Duration of employment in the current hospital	<1 year	3	1.8
	1-3 years	10	6.1
	>3 years - ≤ 5 years	26	15.8
	> 5 years	126	76.4

Scale scores

The mean and median values of the scores obtained from the annual assessments of unit nurse managers conducted by a executive nurse are shown in Table 2. As shown, the highest score was obtained from "Team Management."

Table 2. Nurse Manager Performance Assessment Scale: Descriptive statistics

Items	Mean (SD)	Median (Min.-Max.)
1. Setting a goal	3.3 (0.9)	3.0 (2-5)
2.Determining the method	3.3 (0.8)	3.0 (2-5)
3.Preparing required resources	3.4 (0.8)	3.0 (2-5)
4. Track and control	3.6 (0.8)	3.7 (2-5)
5. Improving efficiency and productivity	3.3 (0.8)	3.0 (2-5)
6. Management of external partners' relations	3.5 (0.8)	3.7 (1-5)
7. Team management	3.7 (0.8)	4.0 (2-5)
8. Self-management	3.5 (0.8)	3.0 (1-5)

Construct validity results

EFA and then CFA were first applied for the construct validity of the Nurse Manager Performance Assessment Scale. Prior to conducting the EFA, the Kaiser-Meyer-Olkin (KMO) index and Barlett's test were performed in order to determine whether the sample size was adequate. The KMO index is used to compare observed correlation coefficients and partial correlation coefficients. In this study, the KMO criterion was found to be 0.929, and the Barlett's test was found to be significant at the p<0.001 level. These

results showed that the data were suitable for factor analysis (Li et al., 2020).

"Rotation of principal components analysis" and EFA were used to examine the factor structure of the scale. The scale was found to show a two-factor structure, and the results were shown in Table 3. It was determined that the first five items included in the scale were included in Factor 1, and the last three items were included in Factor 2. It was found that Factor 1 explained 47.6% of the total variance, while Factor 2 explained 33.17%. Based on the content of items included in the scope of each factor and in the literature, Factor 1 was titled "Business management and organization in the unit," and Factor 2 was titled "Relationships management.

Table 3. Nurse Manager Performance Assessment Scale: Exploratory factor analysis results

Items	Factor 1	Factor 2
1. Setting a goal	0.884	
2. Determining the method	0.887	
3. Preparing required resources	0.793	
4. Track and control	0.691	
5. Improving efficiency and productivity	0.787	
6. Management of external partners' relations		0.857
7. Team management		0.665
8. Self-management		0.826
Variance	47.66%	33.17%
Total variance explained	80.83%	

The two-factor scale structure obtained as a result of EFA was examined using CFA, and the model results are shown in Figure 1. In the model, rectangles represent the observed variables (scale items), ovals represent the latent variables (subscales), and the letter "e" indicates an error or unexplained variance (Pugesek et al., 2003). The model fit indices are shown in Table 4, and it was determined that the model had good fit indices (Çokluk et al., 2021; Steiger, 2007).

Internal and intraclass consistency results

The internal consistency of the Nurse Manager Performance Assessment Scale was examined using the Cronbach's alpha. The Cronbach's alpha coefficient of the overall scale was 0.943. The Split half method Spearman-Brown correlation coefficient was used to evaluate intraclass consistency, and the Spearman-Brown coefficient was found to be "r:.910."

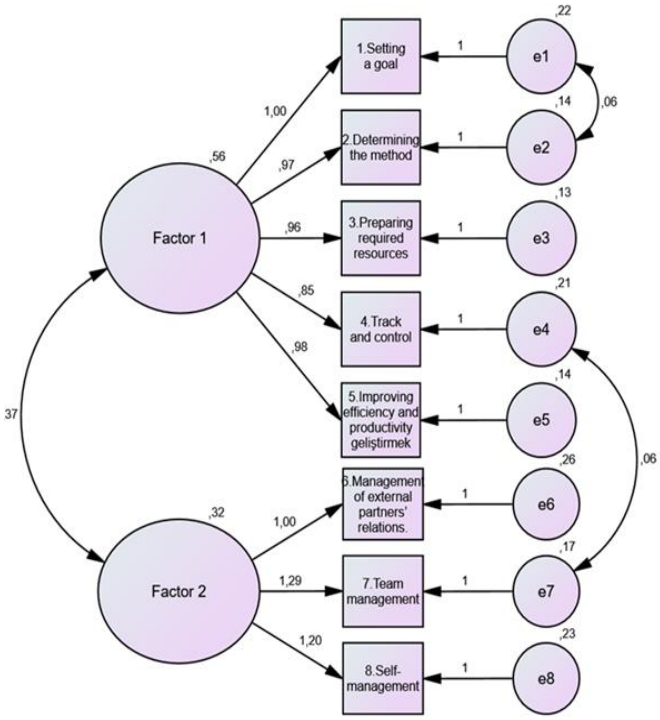

Figure 1. The results of confirmatory factor analysis on the Nurse Manager Performance Assessment Scale: Error variations and path difficulties

Table 4. Nurse Manager Performance Assessment Scale: Fit indices of the model in CFA

Fit indices	Model	Good fit indices
Chi-square: Degrees of freedom ($\chi 2$ /df)	1.804	$0 \leq \chi 2/df \leq 5$
RMSEA	0.070	$0 \leq$ RMSEA ≤ 0.08
RMR	0.019	RMR ≤ 0.05
NFI	0.974	$0.90 \leq$ NFI ≤ 1.00
GFI	0.955	$0.90 \leq$ GFI ≤ 1.00
CFI	0.988	$0.90 \leq$ CFI ≤ 1.00
TLI	0.980	$0.90 \leq$ TLI ≤ 1.00

4. DISCUSSION

In this study, the validity and reliability of the Nurse Manager Performance Assessment Scale was tested based on the longitudinal monitoring of 165 unit nurse managers by their executive nurse for a period of one year, and performance assessment results were obtained at the end of the year. Results showed that the

scale was a valid and reliable instrument (Bolarinwa et al., 2015; Çokluk et al., 2021; DeVon et al., 2007; Pugesek et al., 2003; Steiger, 2007) that can be used to evaluate the managerial performance of unit nurse managers.

This study revealed that the managerial performance of unit nurse managers can be evaluated in two areas (two subscales/two factors) with eight items. Based on the three main areas of competency reported in AONE's AONL (2015), the first factor in this scale includes "The Science: Business Management," and the second factor includes "The Art: Leading the People" and "The Leader Within: Creating the Leader in Yourself." AONE's AONL (2022) announced these nurse leader core competencies in five areas, which are business skills and principles, communication and relationship building, knowledge of the health care environment, professionalism, and leadership, for from first time leaders to experienced executives. A study by Liou et al. (2021) found that managerial competencies were examined in four subscales, and although the main headings were different, the majority of the items included in the subscales were similar to the scope of the criteria included in this scale. In the current study, these categories are expressed more implicitly under the criteria of "preparing required resources," "improving efficiency and productivity," and "self-management" (for example: determines the resources required for the tasks and ensures that resources are provided, ensures that developments are regularly monitored and evaluates how these developments can be utilized in order to provide efficient practices, and establishes creative skills). Consequently, it can be concluded that the scope of these scale items and criteria is largely compatible with the nurse competencies proposed in international studies.

In this study, the Cronbach's alpha and intraclass coefficient of the Nurse Manager Performance Assessment Scale were found to be higher than 0.70. The Cronbach's alpha reliability coefficient is used to evaluate the internal consistency of Likert-type scales. It is noted that a higher Cronbach's alpha coefficient (the closer it is to 1) indicates a higher level of consistency among the items included in the scale, predicting the same property. The Cronbach's alpha coefficient is should ideally be at least 0.70, and it is also indicated that values between 0.80 and 1.00 show a high level of reliability. The Split half method Spearman-Brown correction can also be applied for this purpose. In this study, and as a result of both analyses, reliability coefficients close to 1 indicated that the scale was highly reliable (Bolarinwa, 2015; DeVon et al., 2007).

5. CONCLUSIONS

In this study, the results of the psychometric analysis of the "Nurse Manager Performance Assessment Scale" showed that the scale was valid and reliable. The scale had 2- subdimension which are business management and organization in the unit, relationships management. The fact that this research was conducted using the results obtained based on a longitudinal study offers a significant contribution to the literature. It is recommended that the scale be applied in different institutions for the unit nurse managers' performance assessment. In addition, it is also recommended that the scale be applied in human resources departments for candidate selection, placement, employee training and development, career planning, disemployment, and wage distribution, rather than solely in performance assessment of unit nurse managers.

Conflict of Interest:
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical Approval:
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