
Effect of Pro-Innovative Characteristics on Nurses' Innovative Behavior and Their Perceived Work Role Performance

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Abstract

Background: Pro-innovative characteristics are crucial in promoting nurses' innovative behavior and enhancing their perceived work role performance. Encouraging these characteristics through training and development programs can help healthcare organizations improve their services and promote a culture of innovation. **Aim:** To investigate the effect of pro-innovative organizational and individual characteristics on nurses' innovative behavior and perception of work role performance. **Methods:** This cross-sectional study was conducted at Suez Canal University Hospitals and included 355 staff nurses from surgical and medical departments, as well as intensive care units (ICUs). Data was collected using a self-administered questionnaire consisting of the Corporate Entrepreneurship Assessment Inventory tool, Creative Efficacy scale, Proactivity scale, Employee Innovation Behavior scale, and Work Role Performance Scale. **Results:** 47.3% of studied nurses had high Organizational characteristics while 52.7% of them had low. Also, 80.6% of them had high Individual characteristics and 72.4% of them had high innovative behavior. In addition, this table detects that 81.1% of studied nurses had high perception of work role performance. **Conclusion:** There was high positive correlation between organizational characteristics, individual characteristics, innovative behavior with work role performance. Also, there was high positive correlation between organizational and individual characteristics with the innovative behavior. **Recommendations:** Organizations should encourage and foster innovative behavior among nurses. This can be done through various means such as providing training opportunities, establishing innovation teams, and offering incentives for innovative ideas. Organizations should provide support for nurses in maintaining a work-life balance, especially for those who are married or have other caregiving responsibilities.

Keywords: *Pro-Innovative characteristics, Innovative behavior & Perceived work role performance*

Introduction:

Innovative behavior among nurses refers to their ability and willingness to initiate and implement new ideas, processes, or procedures in their work environment. It involves a proactive approach to problem-solving and improving patient care outcomes. Innovative behavior can manifest in various forms, such as introducing new treatment methods, adopting new technologies, and developing new care delivery models. It is essential for nurses to engage in innovative behavior to ensure that they stay up to date with the latest advancements in the healthcare industry and provide the best possible care to their patients (Lee et al., (2019)). The term "innovation" is derived from the word "innovates," which in Latin means the practice of new techniques in social, cultural, and administrative contexts (Ozberk & Uzunboylu, 2017).

Creative behavior is a person's behavior that encourages the development and intentional implementation of new and valuable ideas, processes, or procedures (Dezsö & Ross, 2012). Pro-innovative characteristics, on the other hand, refer to the individual and organizational traits that can impact

innovative behavior at work. The latter is considered a proactive work behavior that improves performance (Parker & Collins, 2010). Individual innovation involves generating ideas and developing them into valuable solutions. Organizational characteristics assist innovation by promoting new ideas, risk-taking, and valuing innovation across the organization. The second aspect of organizational factors that support innovation involves providing adequate resources (Sönmez et al., 2019).

Healthcare professionals, including nurses, who have a positive attitude towards innovation, can enhance the capabilities of the healthcare system by developing new treatment strategies for patients. When nurses feel that their organizations support innovation, they are encouraged to seek new challenges, engage in new projects, and initiate changes in repetitive tasks, leading to a considerable influence on their innovative behaviors (Esteves & Lopes, 2017). Education and training are also important factors that contribute to the development of innovative behavior among nurses (Cusson et al., 2020)

Prior studies have reported a positive relationship between innovative work behavior and nurses' perception of task performance (Fleury et al., 2017). However, innovative behavior at work and daily work performance may differ in innovation-oriented jobs (Markon et al., 2017). Nevertheless, few empirical studies have addressed innovative behavior in healthcare settings (Moreira et al., 2017).

Perceived work role performance is an individual's perception of their ability to fulfill their work responsibilities effectively. In the context of nursing, perceived work role performance can refer to the nurse's perception of their ability to provide high-quality patient care, collaborate with other healthcare professionals, manage their workload, and fulfill administrative tasks. Perceived work role performance is an essential aspect of nursing practice, as it can impact patient outcomes and overall healthcare quality (Zhao et al., 2020).

Several factors can influence nurses' perceived work role performance, including their experience, education, and job satisfaction. Studies have also shown that pro-innovative characteristics, such as creativity, risk-taking, openness to new experiences, self-efficacy, and proactive personality, can positively impact nurses' perceived work role performance (Fiorini et al., 2022).

Significance of the study:

Innovation is becoming increasingly important in healthcare, and nurses play a critical role in implementing new ideas and technologies. Pro-innovative characteristics are personal traits that encourage innovation, such as creativity, risk-taking, and openness to new experiences. Nurses' perceived work role performance is a crucial aspect of nursing practice that can impact patient outcomes and overall healthcare quality. Pro-innovative characteristics play an essential role in promoting nurses' perceived work role performance by fostering innovation and adaptability in their practice. Therefore, healthcare organizations should prioritize identifying and fostering these characteristics in their nurses to promote innovation and improve healthcare outcomes (Cusson et al., 2020).

Nurses who work in an innovative environment are more likely to engage in proactive, creative job behavior. Conversely, undesirable work environment characteristics can negatively impact the recruitment and retention of qualified nurses. Hence, this study attempts to clarify the inter-relations among pro-innovative features, innovative behavior, and perceived work role performance among nurses. It is hoped that it can provide helpful information that may help nurses perform their work using new ideas and tasks and help health organizations develop

organizational innovation to benefit the health sector. Based on these facts, we hypothesized that nurses' higher pro-innovative characteristics are associated with higher innovative behavior, leading to a higher perception of their work role performance.

Methods

Aim:

The study aimed to investigate the effect of pro-innovative organizational and individual characteristics on nurses' innovative behavior and their perception of work role performance.

Research question:

1. What is the effect of pro-innovative organizational and individual characteristics on nurses' innovative behavior?
2. What is the effect of pro-innovative organizational and individual characteristics on their perception of work role performance?
3. Are there correlations between pro-innovative organizational, individual characteristics, perception of work role performance and nurses' innovative behavior?

Research Design:

This analytic cross-sectional study

Setting:

The study was conducted at Suez Canal University Hospitals and included staff nurses from two surgical departments (male and female), two medical departments (male and female), and three intensive care units: general, post-operative, and cardiac care.

Subjects:

The convenience sample consisted of 355 staff nurses, including 75 with bachelor's degrees and 280 with diploma degrees. There were no inclusion or exclusion criteria. This sample size was sufficient to calculate correlation coefficients of 0.20 or higher (indicating a high effect size) between the three main study variables at a 95% level of confidence and 90% study power, taking into account an expected non-response rate of 20%.

Tools:

A self-administered questionnaire with four tools was used to collect study data. It consisted of the following sections.

- **Section I:** This part considered nurses' demographic characteristics such as age, gender, level of nursing qualification, experience (years), working department/unit, marital status, and residence.
- **Section II: Corporate Entrepreneurship Assessment Inventory (CEAI) tool:** This was developed by Hornsby et al. (1999) to assess the organizational characteristics and nurses' perceptions of their work environment for innovation. It was modified by the researcher based on recent related literature (Xerri, 2012). The tool consists of 27 items, classified into 5 domains, with

a response on a 5-point Likert scale: 'strongly disagree, disagree, neutral, agree, and strongly agree.' These domains are work discretion, which consists of 7 items such as 'I almost always get to decide what I do on my job'; time availability, which consists of 5 items such as 'I always have plenty of time to get everything done'; management support, which consists of 5 items such as 'Money is often available to get new ideas off the ground'; rewards/reinforcement, which consists of 3 items such as 'The rewards I receive are dependent upon my work on the job'; and Leader-Member Exchange, which consists of 7 items such as 'I have a good working relationship with my supervisor'. The total scores were categorized to high if score >70% and low if score 70% or less.

- **Section III:** Individual characteristics tool comprising two sections with a response on a 5-point Likert scale: "strongly disagree, disagree, neutral, agree, and strongly agree." They are as follows.

- **Creative Efficacy scale: Tierney (1997)** developed this scale to evaluate nurses' beliefs about their ability to be creative in their work roles. It consists of three items: "I believe that I am effective in creating new ideas."

- **Proactivity scale:** developed by **Crant (1996)**. It consists of nine items: "I'm always looking for new ways to improve my life," "I can change something if I don't like it".

- The total scores were categorized to high if score >70% and low if score 70% or less.

- **Section IV: The Employee Innovation Behavior scale** was developed by Amo (2005) and was modified by the researcher to assess innovation behavior among nurses. It consists of twelve items, such as "I contribute to conversations concerning improvements at work" and "I prefer to concentrate on topics concerning workplace improvements." The answers are given on a 5-point Likert scale ranging from "never" to "always." Total scores are categorized as high if the score is greater than 60% and low if the score is 60% or less.

- **Section V: The Work Role Performance Scale** is a tool developed by Griffin et al. (2007) to assess nurses' perception of their performance in various levels, including individual, team, and organizational performance. It evaluates proficiency, adaptability, and proactivity in three different domains consisting of 16 items. The response is on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree." The items are categorized into three domains: Individual task behavior (four items, such as "Ensured your tasks were completed properly"), team member behavior (eight items, such as "Responded constructively to

changes in the way your team works"), and organization member behavior (four items, such as "Defended the organization if others criticized it").

Scoring: The responses on a 5-point Likert scale from "strongly disagree" to "strongly agree" The items' scores were summed together. The total scores were transferred into percent scores, and a score of 60% or more was considered high, while a score <60% was considered low.

Tools validity: The tools used in the study were derived from standardized scales and reviewed by a panel of three nursing administration faculty members, including one professor from Zagazig University and two professors from Ain-Shams University. The panel rigorously evaluated the tools for relevance, clarity, and comprehensiveness in terms of face and content validation. Their comments were useful in fine-tuning the tools.

Tool's reliability: The tools' reliability was measured by examining their internal consistency, which revealed high values of Cronbach's Alpha coefficients, indicating good to excellent reliability: 0.94 for Characteristics of Organizations, 0.86 for Individual Characteristics, 0.93 for Innovative Behavior, and 0.91 for Work Role Performance.

Pilot Study

The pilot study was carried out on 36 nurses at the study setting, who represent 10% of the estimated sample size in order to test the applicability of the constructed tools and the clarity of the tools. The pilot also served to estimate the time needed for each subject to fill in the questionnaire. According to the results of the pilot, neither corrections nor omissions of items were performed, so the nurses were included in the pilot study, sharing in the study sample.

Fieldwork:

After obtaining official approvals, the researcher visited the study locations and met with the nurses, providing them with a short orientation to describe the nature of the study. All nurses were invited to participate, and those who gave their oral consent were handed the data collection form and instructions on how to fill it. The study protocol was approved by the Research Ethics Committee in the Faculty of Nursing at Suez Canal University. Each participant filled out the form in the researcher's presence to avoid being influenced by others' responses, which took approximately 15-20 minutes. The researcher provided clarifications impartially when requested. Data collection began at the beginning of November 2021 and continued for two months.

Ethical considerations:

The study protocol was approved by the Research Ethics Committee at the Faculty of Nursing, Suez Canal University. Participants provided oral informed consent after receiving information about the study's purpose and procedures. The study was conducted in a manner that did not cause harm to the participants. Additionally, participants who agreed to participate were assured that their information would be kept confidential and that they could withdraw from the study at any time.

Statistical analysis:

Statistical analysis was performed using SPSS 20.0 statistical package software. Descriptive statistics

were utilized, with qualitative variables represented as frequencies and percentages, and quantitative variables expressed as means, standard deviations, medians, and interquartile ranges. The reliability of the developed tools through their internal consistency was measured using the Cronbach alpha coefficient. The inter-relationships between quantitative and ranking variables were calculated using the Spearman rank correlation. To identify the independent variables of nurses' innovative behavior and their evaluation of work role performance, multiple linear regression analysis was used, along with ANOVA for full regression models.

Results**Table (1): Demographic characteristics of nurses in the study sample (n=355)**

	N	%
Age:		
<30	126	35.5
30-	175	49.3
40+	54	15.2
Range	20.0-55.0	
Mean±SD	32.9±7.2	
Gender:		
Male	98	27.6
Female	257	72.4
Nursing qualification:		
Nursing school diploma	85	23.9
Technical institute diploma	195	54.9
Bachelor	75	21.2
Department / Unit:		
Critical care unit	130	36.6
Surgical department	170	47.9
Medical department	55	15.5
Experience years:		
<10	144	40.6
10-	170	47.9
20+	41	11.5
Range	<1.0-31.0	
Mean ±SD	11.7±6.5	
Median	11.0	
Marital status:		
Unmarried	117	33.0
Married	238	67.0
Residence:		
Rural	126	35.5
Urban	229	64.5

Table (2): Organizational and individual characteristics, innovative behavior, and perception of work role performance of nurses in the study sample (n=355)

	High		Low	
	No.	%	No.	%
Organizational characteristics:				
Work discretion	244	68.7	111	31.3
Time availability	36	10.1	319	89.9
Management support	181	51.0	174	49.0
Rewards/reinforcement	184	51.8	171	48.2
Leader-member exchange	185	52.1	170	47.9
Total organizational	168	47.3	187	52.7
Individual characteristics:				
Creative efficacy	201	56.6	154	43.4
Proactivity	314	88.5	41	11.5
Total individual	286	80.6	69	19.4
Total innovative behavior				
	257	72.4	98	27.6
Perception of work role performance:				
Individual task behavior	303	85.4	52	14.6
Team member behaviors	286	80.6	69	19.4
Organization member behaviors	273	76.9	82	23.1
Total work role performance	288	81.1	67	18.9

Table (3): Correlation matrix between studied variables

		Total organizational characteristics	Total individual characteristics	Total Innovative behavior	Total work role performance
Total organizational characteristics	r.		.327	.701	.561
	p		.004**	.000**	.000**
Total individual characteristics	r.			.487	.715
	p			.001**	.000**
Total Innovative behavior	r.				.504
	p				.001**
Total work role performance	r.				
	p				

(*) Statistically significant at $p \leq 0.05$ (**) Statistically significant at $p \leq 0.01$

Table (4): Correlation between nurses' organizational and individual characteristics and work role performance and innovative behavior, and their characteristics

Items	Spearman's rank correlation coefficient		
	Age	Qualification	Experience years
Organizational characteristics	-.078	-.191**	.030
Individual characteristics	-.122*	-.153**	-.055
Innovative behavior	-.138**	-.257**	-.093
Work role performance	-.099	-.029	-.068

(*) Statistically significant at $p \leq 0.05$ (**) Statistically significant at $p \leq 0.01$

Table (5): Best fitting multiple linear regression model for the innovative behavior score

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value
	B	Std. Error			
Constant	1.77	0.30		5.986	<0.001
Qualification level	-0.21	0.05	-0.19	-3.965	<0.001
Experience year	-0.01	0.00	-0.09	-2.127	0.034
Organizational characteristics					
Work discretion	0.11	0.04	0.13	2.423	0.016
Management support	0.09	0.05	0.11	1.912	0.057
Leader-member exchange	0.14	0.05	0.19	2.694	0.007
Individual characteristics					
Creative efficacy	0.11	0.04	0.17	2.539	0.012
Proactivity	0.23	0.05	0.19	4.213	<0.001

$r\text{-square}=0.37$ Model ANOVA: $F=30.88, p<0.001$

Variables entered and excluded: age, gender, marital status, residence, unit, organizational characteristics time availability, rewards/reinforcement

Table (6): Best fitting multiple linear regression model for the work role performance score

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value
	B	Std. Error			
Constant	1.96	0.23		8.454	<0.001
Qualification level	0.10	0.04	0.12	2.361	0.019
Married	0.15	0.06	0.12	2.639	0.009
Medical unit	-0.14	0.04	-0.17	-3.569	<0.001
Individual characteristics	0.26	0.05	0.26	4.908	<0.001
Innovative behavior score	0.25	0.04	0.32	5.834	<0.001

In the study sample, the nurses' ages ranged between 20 and 55 years, with a median of 33.0 years. The majority (72.4%) were female, as presented in

Table (1): The highest percentage (54.9%) held technical institute diplomas, and 47.9% worked in surgical departments. Their experience varied from less than one to 31 years, with a median of 11.0. Approximately two-thirds of the nurses were married (67.0%) and living in urban areas (64.5%).

Table (2): Displays that 47.3% of studied nurses had high Organizational characteristics while 52.7% of them had low. Also, 80.6% of them had high Individual characteristics and 72.4% of them had high innovative behavior. In addition, this table detects that 81.1% of studied nurses had high perception of work role performance.

Table (3): Reveals that there was high positive correlation between organizational characteristics, individual characteristics, innovative behavior with work role performance at p value <0.01**. Also, there was high positive correlation between organizational and individual characteristics with the innovative behavior at p value <0.01**.

Table (4): Reveals that nurses' age had a significantly negative correlation with innovative behavior scores. Furthermore, nurses' qualification level had a significantly negative correlation with individual characteristics and innovative behavior scores at p < 0.01. Additionally, their qualification level had a significantly negative correlation with organizational characteristic scores at p < 0.01.

Table (5): Presents the results of the multivariate analysis, which identified nurses with higher qualifications and experience years as significant independent negative predictors of the innovative behavior score. Conversely, three of the five domains of organizational characteristics and both individual characteristics domains were identified as significant independent positive predictors. The model explains 37% of the variation in the innovative behavior score. The organizational characteristics domains of time availability and rewards/reinforcement had no significant influence on the score.

Table (6): Presents the results of the predictors of the score of perception of work role performance, which

found that a higher level of qualification, being married, the total score of individual characteristics, and the innovative behavior score were statistically significant independent positive predictors. Conversely, working in a medical unit was a negative predictor. The innovative behavior score was identified as the main positive predictor, followed by the individual characteristics score, as indicated by the standardized beta coefficients. The model explains 25% of the variation in the perception of work role performance score.

Discussion

The current study mentioned that more than half of studied nurses had low organizational characteristics. While, the majority of them had high individual characteristics and high perception of work role performance. Moreover, more than two thirds of nurses had high innovative behavior. These results may be due to nurses who have a strong intrinsic motivation, passion for their work, and a desire to improve patient outcomes are more likely to engage in innovative behavior. These results supported with the study by **Yasir & Majid, 2019** titled in Boundary integration and innovative work behavior among nursing staff, who stated that more than half of nurses had high innovative work behavior. Also, **Al Badi et al., 2023** who conduct study about Work engagement and job performance among nurses in the public healthcare sector in the United Arab Emirates stated that about two thirds of studied nurses had high job performance. Likewise, **Wang et al., 2019** at their study about the mediating role of inclusive leadership: Work engagement and innovative behavior among Chinese head nurses, reported that majority of studied nurses had high creative efficacy. According to the present study results, the scores of organizational characteristics among the nurses in the sample tended to be low, particularly in the domain pertaining to time availability. This is quite anticipated given the universally known shortage of nursing staff associated with high workload and time constraints. Thus, a study of nurses' view of organizational characteristics in Jordan showed that providing enough time to provide care to patients was

the most influential factor in their view of these characteristics (Mrayyan, 2019).

The low organizational characteristics scores as identified in the current study would have a negative impact on nurses' satisfaction, commitment, and performance. In congruence with this, a study on health professionals in France demonstrated that the organizational characteristics are significantly associated with their compliance with professional practice guidelines (Sailleur-Glénisson et al., 2017). In line with this, a study in San Francisco, United States, reported moderately good levels of innovative behavior among hospital nurses (Dy Bunpin et al., 2016). Similarly, high scores of innovative behaviors were also reported in studies in China (Zhang et al., 2017; Nazir et al., 2018). Conversely, Susanty (2018), in a survey of nurses' work stress and its relation to individual and organizational characteristics in Indonesia, showed that only a minority of the nurses were proactive. The discrepancies are expected given the numerous setting-related factors influencing nurses' innovative behavior.

This study's high innovative behavior scores may be attributed to recent trends in innovative approaches in education and healthcare practices, particularly in nursing. New educational approaches, such as problem-based learning and critical thinking, have been well-established, along with the application of evidence-based practices. Additionally, these new educational approaches encourage students to be more information-seeking, which is associated with more innovative behavior, as shown in two studies of Chinese nursing students (Zhong et al., 2018; Shen et al., 2021).

According to the correlation between studied variables, our study mentioned that there was high positive correlation between organizational characteristics, individual characteristics, innovative behavior with work role performance. Also, there was high positive correlation between organizational and individual characteristics with the innovative behavior. These results attributed to nurses engage in innovative behavior, they are more likely to identify and address problems, find more effective and efficient ways to provide care, and improve patient outcomes. This can result in higher job satisfaction, increased confidence, and a greater sense of fulfillment in their work. These results cohort with the study by Xiang et al., 2023 at their study about Relationship among clinical practice environment, creative self-efficacy, achievement motivation, and innovative behavior in nursing students: A cross-sectional study, found that A positive clinical practice environment was associated with more innovative behavior, and this relation was partially mediated by

creative self-efficacy and motive to avoid failure. Also, Dan et al., 2018 titled in Innovative behavior and career success: Mediating roles of self-efficacy and colleague solidarity of nurses and detected that innovative behavior, self-efficacy, colleague solidarity of nurses and career success; each dimension showed positive correlation ($r = 0.145$ to 0.923 , $P < 0.05$). Elewa & El Banan, 2022 who conducted study about Work design, entrepreneurial leadership, and innovative work behavior as perceived by staff nurses and reported that there was statistically significant relationship was found between overall perceptions of entrepreneurial leadership and innovative work behaviors among staff nurses.

Regarding the personal factors influencing innovative behavior, the present study found negative correlations between nurses' innovative behavior scores and their age and level of qualification. The multivariate analysis confirmed the negative effect of higher qualification and longer experience years. The findings might be explained by the resistance to change as individuals get older. Additionally, the longer experience years make any innovative change more difficult to accept. A similar negative association between nurses' innovative behavior and age was previously reported (Hendel et al., 2020). Also, Markon et al. (2017), in a study on work role performance among Canadian health professionals, found that their perception is significantly related to the level of their educational attainment.

The main objective of the current study was to investigate nurses' perception of work performance and how it is influenced by their innovative behavior and organizational and individual characteristics as pro-innovative factors. The study results indicate that nurses reported high scores of perceptions of work role performance, which was significantly and positively correlated with the scores of organizational and individual characteristics. Moreover, the multivariate analysis demonstrated that the innovative behavior score was the most influential positive predictor and the individual characteristics score. These results support the research hypothesis.

A study of work engagement and role performance in Japan demonstrated a direct linear relationship between innovative behavior and work engagement and, consequently, role performance (Shimazu et al., 2018). Similarly, a study in the United States reported that low perception of work role performance was significantly related to low creativity (Thompson & Bolino, 2018). Moreover, the findings are in line with those of Fleury et al. (2019a), whose study in Canada concluded that innovation is essential for a better perception of work role performance.

The present study's results demonstrated that nurses' scores of individual characteristics were positive predictors of their perception of work role performance. This finding may be due to the close correlation between the creative efficacy and proactivity domains of individual characteristics and the innovative behavior scores. Thus, nurses who are more creative and proactive tend to exhibit more innovative behavior. These findings are consistent with those of **Fleury et al. (2019b)**, who identified individual characteristics as significant predictors of work role performance among mental health care teams in Canada. A similar relationship was reported by **Mahardika et al. (2019)** in a study of the effect of individual characteristics on nurses' work role performance in Indonesia. However, **Puspita & Hidayah (2019)** found that individual characteristics were a negative predictor of work role performance among nurses in another study from Indonesia. The differences in findings could be explained by variations in the study samples and tools used to measure individual characteristics".

Additionally, the perceptions of work role performance among the nurses in the present study were influenced by their marital status, level of qualification, and work department. Thus, being married and having a higher nursing qualification were associated with higher perception scores. In congruence with this, a study in South Korea reported a significant association between nurses' perception of work role performance and their marital status (**Kim et al., 2016**). Moreover, the work in a more specialized care unit, as in ICU, increased the score of perception of work role performance compared with working in a medical department, which is in line with the findings of **Markon et al. (2017)** study.

Conclusion

In conclusion, there was high positive correlation between organizational characteristics, individual characteristics, innovative behavior with work role performance. Also, there was high positive correlation between organizational and individual characteristics with the innovative behavior. Also, the higher level of qualification, being married, the total score of individual characteristics, and the innovative behavior score were statistically significant independent positive predictors for perception of work role performance score.

Recommendation:

Organizations should encourage and foster innovative behavior among nurses. This can be done through various means such as providing training opportunities, establishing innovation teams, and offering incentives for innovative ideas.

Organizations should provide support for nurses in maintaining a work-life balance, especially for those who are married or have other caregiving responsibilities. This can be done by offering flexible work arrangements such as part-time work, telecommuting, or flexible schedules. Educational programs for nurses' innovative development should be planned by hospital management.

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