



A Comparative of Job Stress among Nurses in the Intensive Care Unit: Primary Nursing vs. Case Method

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Abstract

Introduction: Healthcare centers have been established with the aim of providing quality, safe, and effective care. In order to achieve these goals, nursing managers have the responsibility to choose a nursing care delivery model that ensures quality and minimizes the job stress of nurses. The objective of this study was to compare the impact of primary nursing and case method on job stress of nurses working in the intensive care unit (ICU).

Methods: This was a pilot quasi-experimental study which two nursing care methods, primary nursing and case method, were compared using a pretest-posttest design. The study population consisted of 25 nurses working in the ICU. The data collection tools included demographic questionnaires and an expanded version of the nursing stress scale. The collected data were analyzed using SPSS version 25 and running paired samples t-test.

Results: Based on the findings, the demographic characteristics of nurses did not show statistically significant differences between two groups ($p > 0.05$). The mean total score of job stress for nurses in the case method group (25.12 ± 125.16) was significantly higher than in the primary nursing group (16.07 ± 109.04) ($p = 0.009$).

Conclusions: According to the findings, the provision of nursing care through the primary nursing method reduced job stress among adult nurses in the ICU. Therefore, it is recommended to give more attention to the primary nursing approach in the management planning of nursing care.

INTRODUCTION

The intensive care unit (ICU) is an essential and vital department in hospital [1] by delivering proper medical services, utilizing modern medical equipment optimally, and employing skilled and qualified staff, can effectively contribute to the restoration of health for critically ill patients and provide continuous and comprehensive care [2]. Proper management of patients in critical conditions requires an adequate and efficient human resource, especially nurses [3]. Nurses play a crucial role as one of the largest groups of healthcare providers [4,

5]. The responsibility of nurses in the ICU differs from other departments due to its unique and individualized nature [6], and working conditions in ICU settings worldwide can create pressure on healthcare professionals due to the presence of patients with life-threatening symptoms and challenges in healthcare systems [7].

Job stress, on the other hand, is an emotional, cognitive, behavioral, and psychological response resulting from individual and organizational stressors and is considered

the second most common work-related illness after musculoskeletal disorders [8]. The job stress occurs when work pressures exceed an individual's ability to cope with them [9]. Although stress exists in all professions. Nurses face significant stress due to their specific job positions and professional issues[10], to the extent that nursing is inherently recognized as a high-stress occupation[9]. Job stress is prevalent in nursing and affects physical, psychological, and social well-being [11]. Nurses in the ICU experience higher levels of job stress due to various stressors, including dealing with critically ill and ventilated patients, the instability of patients' conditions, the presence of diverse equipment and the need to operate them, the ambiguity of authority levels, role ambiguity, a high volume of work, conflicts with physicians, colleagues, and patients' families[12]. These factors leading to negative outcomes such as delayed or absent work, depression, fatigue, and reduced job performance, which ultimately affects the quality of care provided. job stress has negative effects on individuals' physiology, psychology, and personal behaviors, such as job performance [11]. Job stress places a financial burden on healthcare systems, and these various stressors can not only have an impact on various aspects of health, including mood and different threats to well-being but also result in reduced care quality, feelings of incompetence, and depression among nurses [13]. Furthermore, it can lead to increased absenteeism, resignations, job abandonment, and organizational conflicts[14].Therefore, one of the challenges that affects employees is a highly stressful work environment. In healthcare organizations, a stressful work environment can have an impact on the employees' health (both physical and mental) and the quality of care provided to patients [15]. Considering the unavoidable nature of some stressors in the nursing profession, particularly in intensive care units, the improvement of working conditions, including the appropriate implementation of workload distribution, falls under the responsibility of hospital managers[16]. The human resource management can play a significant role in improving the situation. One of measures can be the implementation of an appropriate task allocation method in the workplace. The methods of providing nursing care have evolved over time. However, traditionally, four nursing models and most current nursing systems proposed. These models include: a) team nursing, b) functional nursing, both of which are task-oriented, c) primary nursing, and d) case method, which is patient-centered[17].The case method is one of the oldest systems for delivering clinical services. In this method, patients are divided according to their needs and the level of skill and knowledge of the nurse. The nurse is responsible for all the care of these patients during their shift. The patient has various nurses during different shifts. The nurse is responsible for planning,

organizing, and providing care during their shift, and if the patient is not assigned to them in the future days, continuity of care and proper communication between the patient and nurse will not be established[18]. Marie Manthey introduced the primary nursing model in the late 1960s in the United States. In this method, a nurse is designated for the patient, staff, and caregivers, and is assigned as the responsible person for nursing care during the patient's hospitalization[19]. The primary nurse assesses and prioritizes the needs of each patient and plans and evaluates their care .In the absence of the primary nurse, other nurses working as a substitute [20]. Typically, in primary nursing, only one nurse is assigned to a patient, and in some cases, two or three nurses are assigned from admission to recovery. The goal of primary nursing is to provide maximum patient-centered and comprehensive individualized care [21, 22].Based on the above information, the aim of nursing care models is to provide professional performance to ensure systematic, continuous, and efficient care [19]. The goal of nursing methods is to reduce confusion, job stress, and improve the quality of nursing work life. However, there is no consensus on which method has a higher priority based on the circumstances [24 ,23]. The little is known about the potential associations between various models and work-related psychosocial profiles in nurses [25].Therefore, this study was conducted to compare the impact of primary nursing and case method on job stress of nurses in the ICU.

METHODS

This was a pilot quasi-experimental study that compared two nursing care methods, primary nursing and case method, using a post-test design. The study population consisted of nurses working in the ICUs of Shahid Sadoughi University of Medical Sciences hospitals in Yazd in 2023. The inclusion criteria were having a minimum of a bachelor's degree in nursing and full-time employment in the ICU, while the exclusion criteria were nurses who were on leave or absent during the study period and nurses who changed their ward. During the study, one nurse changed her ward, and a new nurse with previous experience in the ward was recruited after completing treatment. Twenty-five nurses participated in this study and were included through census sampling in both groups (primary nursing and case method).

To implement the study, the objectives were explained to the nurses, and informed consent was obtained. At the beginning of the study, the division of nursing work in the ICU was carried out in the form of case method. Therefore, all nursing staff completed a self-report nursing stress questionnaire. Subsequently, planning and preparation were done for implementing the primary nursing method in the same department and

same nurses. Then head nurse selected more experienced and skillful seven nurses as senior nurses for the primary nursing method. A one-day workshop on nursing care methods was conducted by the nursing management lecturer from the nursing faculty for nurses in two shifts in conference room of hospital. Considering that the department has 10 beds, on average, each shift has one or fewer new admissions, and there are 25 nurses in the department. Seven selected nurses (senior nurses) were assigned as responsible nurses for patients in the primary nursing method during shifts. These selected nurses underwent a short-term workshop in ten hours to review, monitor, and care for common hospital-acquired diseases in the ICU by faculty member of nursing. After preparing the necessary arrangements, the monthly work schedule for nurses was adjusted so that at least one senior nurse was present during each shift. This nurse was responsible for planning nursing care and monitoring the quantity and quality of care provided to the patient from admission to discharge. The patient care plan was written by the responsible senior nurse and implemented with the assistance of other nurses.

The data collection tool was a questionnaire. The first part of the questionnaire-contained questions about nurses' demographic includes age, gender, marital status, educational level, overall work experience, experience in ICU, and shift type. The second part was Expanded Nursing Stress Scale (ENSS) for the investigation of nurses' work related stress is one of the most widely used scales which has already been adapted and validated in Greek and developed by Gray-Toft & Anderson[26]. The ENSS consisted of 57 items. This questionnaire the frequency and primary sources of stress in patient care situations and includes nine subscales: death and dying (6 items), conflicts with physician (5 items), inadequate emotional preparation (3 items), problems with colleagues (7 items), problems with supervisors (7 items), workload (9 items), uncertainty about treatments (9 items), patients and their families (8 items), and discrimination (3 items). To score the questionnaire, fifty-seven items were set on a five-point Likert scale, and participants were required to select one of the following options based on the frequency of their experienced situations: 1 = No stress at all, 2 = Sometimes stressed, 3 = Often stressed, 4 = Highly stressed, 5 = This situation does not apply to my responsibilities. If an individual has not encountered such a situation, they mark zero. To obtain the score related to each subscale, the scores of all items associated with that subscale summed together. Higher scores indicate higher job stress in that specific area, with a minimum score of zero and a maximum of 285. To calculate the mean of each subscale, the total score of items related to that subscale is divided by the number of items [27]. This questionnaire has demonstrated

satisfactory validity and reliability in previous studies [28]. The validity of questionnaire confirmed by experts reliability o was obtained by calculating the Cronbach's alpha coefficient, which was found to be 0.96 [29]. Additionally, Malemi and Adrom calculated the Cronbach's alpha coefficient of this questionnaire to be 0.93 [14]. In this study, Cronbach's alpha was 0.81. The nurses through self-reporting completed the questionnaire. It should be noted, that the ICU nurses completed the questionnaires in at least after three months of the implementation of nursing care methods. The Expanded Nursing Stress Scale (ENSS) is available at the following web address: https://www.researchgate.net/publication/12103164_An_Empirical_Evaluation_of_an_Expanded_Nursing_Stress_Scale.

The ethical code was obtained from the Ethics Committee of Shahid Sadoughi University of Medical Sciences, Yazd, with the number IR.SSU.REC.1400.113. Informed consent was also obtained from the nurses for their participation in the study.

After data collection, the data were coded and entered into the SPSS version 25. Descriptive statistics such as mean, standard deviation, absolute and relative frequency were used, as well as inferential statistics such as paired samples t-test. The significance level was set at 0.05, and the Kolmogorov-Smirnov test was used to determine the normality of the data distribution.

RESULTS

According to the findings, the average work experience of nurses was 12.25 ± 1.58 . the nurses did not have statistically significant differences in terms of demographic characteristics such as age, work experience in the ICU, educational level, gender, marital status, shift type, and overall work experience ($p > 0.05$) (Table 1).

Other findings showed that the mean total score of job stress among nurses in the case method and primary nursing groups had a significant difference ($p > 0.009$). Furthermore, a significant difference was found in the sub-scales of death and dying, conflict with physicians, problems with colleagues, problems with supervisors, uncertainty about treatments, and discrimination between two groups ($p < 0.05$). However, no statistically significant differences were found in the sub-scales of inadequate emotional preparation, workload, and patients and their families between groups ($p > 0.05$) (Table 2).

DISCUSSION

This study was conducted to compare the impact of primary nursing and case method on job stress of nurses in the ICU. The findings showed that the majority of nurses in both groups had a bachelor's degree, were

female, worked in rotating shifts, and had less than ten years of overall work experience. There are differences in care delivery model descriptions and a lack of agreement on the strengths and weaknesses of the care delivery models such as nursing job stress[30].The implementing a care delivery and organization method could be considered through the available human

resources, the stability in staffing, the size of the units, the professionals' skill mix and experience, as well as the ethos of care. The primary nursing model also reduces nurses' experiences of stress and seems to be conducive to a more positive workplace community [31].

Table 1. The frequency distribution of the demographic characteristics of the study nurses in two groups

	Case method		Primary nursing		Paired Samples t Test
	Mean	SD	Mean	SD	
Age	30.24	9.18	31.32	6.25	0.52
Work experience in the intensive care unit	4.24	3.87	4.40	3.77	0.24
Subgroup. Variable	N	%	N	%	Chi-square test
Level of Education					0.36
BS	22	88%	23	92%	
MS	3	12%	2	5%	
Gender					0.53
Female	15	60%	16	64%	
Male	10	40%	9	36%	
Marital status					0.8
Single	12	48%	13	52%	
Married	13	52%	12	48%	
Shift type					1
fixed shift	0	0	0	0	
rotating shift	25	100%	25	100%	
Work experience					0.72
Less than 10 years	20	80%	19	76%	
More than 10 years	5	20%	6	24%	
Total	25	100%	25	100%	

Table 2. Comparison of the mean score of job stress among nurses in two groups

Job Stress among Nurses	The number of terms	Minimum-maximum questionnaire score	Case method	Primary nursing	Paired Samples t Test
Death and dying subscale	6	0-30	3.93 ± 18.24	2.64 ± 12.6	0.0001
Conflict with doctors	5	0-25	3.21 ± 12.08	3.95 ± 10	0.047
Lack of emotional preparation	3	0-15	1.49 ± 5.92	1.25 ± 5.8	0.76
Problems with colleagues	7	0-35	3.52 ± 8.92	2.19 ± 11.20	0.008
Problems with supervisors	7	0-35	4.42 ± 16.24	2.48 ± 12.36	0.0001
Workload	9	0-45	5.59 ± 18.24	3.00 ± 15.96	0.07
Uncertainty about treatments	9	0-45	6.05 ± 23.96	3.05 ± 16.92	0.0001
Patients and their families	8	0-40	4.19 ± 15.36	3.31 ± 15.20	0.97
discrimination	3	0-15	3.95 ± 6.2	0.95 ± 8.80	0.002
Total score	57	0-285	25.12 ± 152.16	16.07 ± 109.04	0.009

Data in table are presented as Mean ± SD.

On the finding, the total score of job stress among nurses was lower than the median in both nursing care methods and in the primary nursing method was significantly lower than in the case method group. Therefore, it can be concluded that the implementation of the primary nursing method reduced job stress among nurses. Other findings showed, the implementation of the primary nursing method reduced job stress among nurses in the sub-scale of death and dying, conflict with physicians, problems with supervisors, workload, and uncertainty about treatments. However, sub-scales of inadequate emotional preparation and patients and their families were similar in both groups, and it increased problems with colleagues and discrimination. Nursing is a highly stressful profession, and different work environments may create job stress for nurses. However, having appropriate staff for good nursing care and minimizing stressful work is essential. The primary nursing care

model can be used to reduce nurse stress, especially in intensive care units. In line with our study results, Fazlollahi et al., (2016) in their study reported that implementing primary nursing care method in the open heart surgery department led to nurse satisfaction with the care provided[22]. Mattila et al., (2014) reviewed the effects of primary nursing care model and concluded that there was limited evidence regarding the positive effects of the primary nursing care model on nursing staff. However, this model can help increase job control and independence [23]. Amarnah (2017) in his study in Jordan showed that 42.8% (125=n) of nurses in teaching hospitals used the primary nursing care model compared to 23.9% (41=n) in non-teaching hospitals (p<0.001). In teaching hospitals, work shift was the only predictor of job stress among nurses, while work shift and nursing care model were predictors of social support behaviors. In non-teaching hospitals, work shift and

nursing care model were predictors of job stress among nurses Cocchieri (2023) yielded that nurses working as primary nurses reported a better understanding of their competence, and the primary nursing care model had a significant positive correlation with the development of nursing competence [20]. However, Rantanen et al., (2016) showed, there were no significant differences in motivational characteristics between the primary nursing model and the individual patient allocation model [25].

Based on the results of this study and other studies, primary nursing and case method each have advantages and limitations. Based on the evidence of the present study, the implementation of primary nursing was more effective in reducing the occupational stress of nurses, however, for the primary nursing method to be more effective, modifying method methods should be used to reduce occupational stress in some subscales.

One of the strengths of the current study was the implementation of primary nursing in an intensive care unit, which required cooperation and coordination within and between many departments in the nursing, medical and hospital management, which can be a guide for measures to improve the quality of life of nurses, especially in developing countries. One limitation of this study was the use of a questionnaire as a data collection tool relying on self-reporting. The mental and psychological conditions of nurses could influence their responses to questions, which was beyond the researcher's control. Another limitation of the study was the small sample size.

CONCLUSION

Based on the findings, the implementation of the primary nursing method significantly reduced job stress among nurses. Considering the effectiveness of implementing the primary nursing method in reducing nurse job stress, it is recommended to plan for its implementation in other departments to reduce job stress in nursing, which is one of the challenges in nursing. On the other hand, it is suggested to provide training on new methods of nursing care in general and supplementary nursing programs for all nursing levels.

ETHICAL CONSIDERATIONS

This study was carried out in accordance with the Declaration of Helsinki. This study was approved by the Committee of Ethics in Human Research at Shahid Sadoughi University of Medical Sciences and health services in Yazd IR.SSU.REC.1400.113). In addition, informed written consent forms were obtained from all participants.

CONFLICT OF INTERESTS

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTIONS

PB & HN & KHN conceptualized and designed the study. PB collected the data. PB & HN analyzed the data. All authors have met criteria for authorship and had a role in preparing the manuscript. Also all authors approved the final manuscript.

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