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How Does Workload Affect the Innovative Approach of Intensive Care Nurses? A Cross-Sectional Descriptive Study

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How Does Workload Affect the Innovative Approach of Intensive Care Nurses? A Cross-Sectional Descriptive Study

İş Yükü, Yoğun Bakım Hemşirelerinin Yenilikçi Yaklaşımını Nasıl Etkiliyor? Kesitsel-Tanımlayıcı Bir Çalışma

ABSTRACT

Objective:

Intensive care nurses (ICN) worldwide are engaged in innovative activities and initiatives daily that lead to significant improvements in health with the aim of improving patient care outcomes and reducing health care costs. The workload of the ICNs may affect their creative and innovative approach. The aim of this study is to determine the impact of ICNs workloads during the patient care on attitudes towards innovative approaches.

Material and Methods:

This is a cross sectional descriptive study. One hundred and thirty eight nurses working in intensive care units at a city training and research hospital in Turkey constituted the sample. Data was collected using "Participant Information Form", "Individual Innovativeness Scale in Nursing Profession" (IIS) and the "Workload Scale". Kolmogorov-Smirnov normality test, Mann Whitney U test, Kruskall-Wallis test, and Spearman's correlation were used for statistical analyses. Demographic statistics are also given.

Results:

According to IIS, 2.2% (n=3) of respondents are innovators, 0.7% (n=1) pioneers, 4.3% (n=6) interrogators, 13.8% (n=19) skeptics, and 79% (n=109) traditionalists. Participants had an average score of 5.00±1.17 and a total score of 2.94±0.44. Differences were found between the workload and the innovativeness subscale of IIS (p=0.012).

Conclusion:

The results of our study revealed that the ICNs have excessive workloads and most of them have a traditional attitude to individual innovation.

Key Words:

Workload, Innovative, Intensive care, Nurse

ÖZ

Amaç:

Dünya çapında yoğun bakım hemşireleri, günlük olarak hasta bakım sonuçlarını iyileştirme ve sağlık bakım maliyetlerini düşürme amacıyla, sağlık alanında önemli gelişmelere neden olan yenilikçi faaliyetler ve girişimlerde bulunmaktadır. Yoğun bakım hemşrelerinin iş yükünün fazla olması yaratıcı ve yenilikçi yaklaşımlarını etkileyebilmektedir. Bu çalışmanın amacı, yoğun bakım hemşirelerinin hasta bakımı sırasındaki iş yüklerinin yenilikçi yaklaşımlara yönelik tutumları üzerinde etkisini belirlemektir.

Gereç ve Yöntemler:

Çalışma, kesitsel ve tanımlayıcı tipte yapılmıştır. Çalışmanın örneklemini Türkiye'de bir şehir eğitim ve araştırma hastanesinin yoğun bakım ünitelerinde çalışan 138 hemşire oluşturdu. Veriler "Tanılama Formu", "Bireysel Yenilikçilik Ölçeği'nin Hemşireliğe Uyarlanmış Versiyonu" ve "İş Yükü Ölçeği" ile toplanmıştır. İstatistiksel analizlerde Kolmogorov-Smirnov normallik testi, Mann Whitney U test, Kruskall-Wallis test, Spearmans Korelasyon kullanılmıştır. Ayrıca tanıtıcı istatistikler de verilmiştir.

Bulgular:

Bireysel Yenilikçilik Ölçeği'ne göre katılımcıların %2,2'si yenilikçi, %0,7'si öncü, %4,3'ü sorgulayıcı, %13,8'i kuşkucu, %79'u ise gelenekçidir. İş yükü ölçeğinin puan ortalamasının 5,00±1,17, Bireysel Yenilikçilik Ölçeği'nin toplam puan ortalamasının 2,94±0,44 olduğu saptandı. İş yükü ile Bireysel Yenilikçilik Ölçeği'nin alt boyutu arasında farklılık bulundu (p=0.012).

Sonuç:

Çalışmamızın sonucunda yoğun bakım hemşirelerinin iş yüklerinin fazla ve çoğunluğunun bireysel yenilik konusunda geleneksel bir tutum sergilemekte olduğu saptandı.

Anahtar Kelimeler:

İş yükü, İnovasyon, Yoğun bakım, Hemşire

INTRODUCTION

Developments in health and technology lead to the developments and changes in nursing services day by day. Workload is defined as situations and activities in which nurses working in health services are involved in as part of their work time daily (1). de Cordova et al. (2010) stated that the nursing workload is a function of the time, complexity and work volume of the interventions that need to be done in a certain period regarding a particular patient group and nursing needs (2). Changes such as the increase in the number of patients and disease diversity in the work environment, the increase in requests, the restructuring of services and facilities, the scarcity of beds, cost containment measures and staff shortages lead to changes in work conditions and an increase in workloads (1, 3). Professional nursing includes not only routine work but also the ability of the nurse to reveal their independent roles, to think critically, to be open to development and changes, and to control the time and complexity associated with the overall workload (1, 4).

Purposeful changes are an important element in nursing to identify new ways to deliver quality care and improve the health of the profession, patients and the community (5). This element also points to innovation. Training nurses with skills and attitudes open to innovation enables them to accept innovation in professional life after graduation, to take part in innovative initiatives, to see the opportunities that come with change, to create new ideas, to solve new and old situations, and to be a leader in this field (5, 6). Such knowledge and skills allow valuable ideas in nursing that lead to permanent innovation for clinical practice (5, 7). ICUs are units with high costs due to advanced technology and medical equipment, special infrastructure and specially trained staff. One of the main problems of nurses working in intensive care units is heavy workload. This workload reduces the quality and safety of patient care, as well as increases human errors, hospitalization rates and the risk of death in patients, thus leading to an increase in healthcare costs (8, 9). ICUs are a stressful working environment with complex patients and need for direct patient care, where the reliability of nursing care and care process is negatively affected due to the increase in workload (3, 10).

It is important to provide care with advanced technological equipment in intensive care units where patient safety and patient outcomes are more important. It is extremely important for nurses working in intensive care units to be open to innovation to increase the quality of patient care, prevent diseases, improve health and adapt to information technology. To use technology correctly and effectively, nurses working in intensive care units should have the knowledge, skills and attitudes to be able to evaluate the scientific and ethical dimensions of technology, and to plan appropriately in the unit they work (11, 12).

The heavy workload of intensive care nurses may affect their creative and innovative approaches. Intensive care nurses around the world engage in innovative activities and initiatives that lead to significant advances in healthcare daily with the aim of improving patient care outcomes and reducing healthcare costs. The working conditions and the workload of the nurses are important in the continuity of these activities. There is a multi-component effect of workload on professional practices (13). Providing care within the framework of professional values of intensive care nurses, appropriate work environment conditions, institutional policies and opportunities, and appropriate planning in the workplace will positively affect creativity and innovation, while it will also have a positive effect on patient care outcomes. The aim of this study is to determine the impact of intensive care nurses' workloads during the patient care on attitudes towards innovative approaches.

Research Questions

Does the workload level of intensive care nurses affect their innovative approaches?

Do the demographic characteristics of intensive care nurses affect the innovative approach and workload?

MATERIAL and METHODS

Type of Research

The research is cross-sectional and descriptive.

Location and Characteristics of the Research

The study was carried out with nurses working in intensive care units between 15.02.2021 and 15.05.2021 in a city training and research hospital in southern Turkey.

The Universe of the Research

The universe of the research consisted of 310 nurses working in the intensive care units of a city training and research hospital in Turkey. Intensive care nurses who agreed to participate in the research after information about the study was provided were included in the study. A sampling method was not used. One hundred and thirty-eight nurses working in intensive care units at a city training and research hospital in Turkey constituted the sample.

Data collection

"Participant Information Form", "Individual Innovativeness Scale in Nursing Profession" and "Workload Scale" were used to collect data.

Participant Information Form: There are 15 questions created by the researchers after reviewing the literature aimed to determine the socio-demographic and professional characteristics of nurses and their approaches to individual innovativeness and workload (14, 15).

Individual Innovativeness Scale in Nursing Profession (IIS): This scale was developed by Hurt, Joseph and Cook (1977) to measure the innovativeness level of individuals (16). The validity and reliability study of the Nursing Adapted Version in Turkish was conducted by Sarıoglu Kemer and Altuntas in 2017. The Turkish version is a five-point Likert-type (strongly disagree: 1, strongly agree: 5) scale, which includes 18 items and 3 sub-dimensions (opinion leadership, resistance to change, risk taking) (17). According to the score obtained on the scale, the innovativeness level of individuals in general can also be determined (17). The Cronbach alpha internal consistency coefficient of the scale was determined to be α=0.82 (17). In our study, the Cronbach alpha internal consistency coefficient was found to be α=0.757.

Workload Scale (EPS): This six-point Likert type scale developed by Turgut in 2011 consists of five items. An average score is calculated for the five items. An increase in the score means that the workload increases (18). The Cronbach alpha internal consistency coefficient obtained on Turgut's research sample for the scale was α=0.72 (18). In our study, the Cronbach alpha internal consistency coefficient was α=0.872.

Application of data collection forms

After the intensive care nurses were informed about the study, data collection forms were distributed to the intensive care nurses over the age of 18 who agreed to participate in the study, who had been working in the intensive care unit for at least one year and met the inclusion criteria. Filling the data collection forms took approximately 10-15 minutes.

Statistical analysis

Statistical analyses were performed using the IBM SPSS Statistics Free Download package program. The Cronbach's alpha test was used to evaluate the internal consistency with the cut-off value of ≥0.70. Necessary calculations were made by taking the average of the Likert type scales. Kolmogorov-Smirnov normality test was performed which revealed that the data were not normally distributed. Mann Whitney U test, a nonparametric test, was used in pairwise comparisons, and Kruskall-Wallis test was used in comparisons with more than two groups. Spearman Correlation was used to examine scales, subgroups and other variable relationships. Descriptive statistics are also given $p<0.05$ was considered significant in the statistical tests.

Ethical considerations

Permission was obtained from the Mersin University Faculty of Medicine Non-Invasive Clinical Research Ethics Committee (Number: 66, Date 20/01/2021). In addition, written permission from the health directorate of the province where the study was conducted (Number: E-96172664-799, Date: 15.02.2021). Before data was collected, a written informed consent was obtained from the participants after the purpose of the research in accordance with the Helsinki Declaration was explained. Also, participants were informed about the fact that their participation is voluntary, and their answers will be kept confidential and evaluated only as scientific data.

RESULTS

67.4% (n=93) of the participants in the study were female, 32.6% (n=45) were male, and the mean age was 32.89±8.29. 3.6% (n=5) graduated from vocational health high school, 8% (n=11) had associate degree, 75.4% (104) undergraduate degree, and 13% (n=18) graduate degree. 55.1% (n=76) of the nurses were married whereas 44.9% (n=62) were single. 82.6% (n=114) of the participants had a nuclear family, 12.3% (n=17) an extended family, 5.1% (n=7) broken family. Average number of children was 1.02±0.96. Participants have been in the nursing profession for on average 9.60±8.16 years and working as an intensive care nurse for 4.64±4.50 years. 8.7% (n=12) worked during the day, 2.9% (n=4) at night, 88.4% (n=122) on both day and night shifts. The average weekly hours worked was 52.71±9.76.

%26.8% (n=37) of the participants follow the publications related to their profession, 73.2% (n=101) do not, whereas 74.6% (n=103) follow current professional information on the internet, % 25.4(n=35) do not. The average duration of using the internet per day was 4.97±3.19 hours. 92% (n=127) of the participants stated that innovative approaches in nursing are necessary, 1.4% (n=2) of them stated innovative approaches are not necessary in nursing and 6.5% (n=9) stated that they were undecided. When asked to define the concept

of innovation; 24.6% (n=34) stated use of current and scientific information and new devices, 5.8% (n=8) accelerated patient recovery, 23.2% (n=32) new research, 9.4% (n=13) creativity and making work easier and 37% (n=51) left this question blank.

The descriptive characteristics of the participants in our study in terms of individual innovativeness and workload were evaluated separately. There was a statistical difference between the genders in terms of individual innovativeness (p=0.018). According to our results, the mean IIS score of men (3.01±0.42) was significantly higher than of women (2.87±0.52). There was no difference between the other descriptive characteristics of the participants in terms of individual innovativeness and workload (Table I).

Table I. Comparison of Participants' Demographic Characteristics and Individual Innovation and Workload Scales (n=138)

		Individual Innovativeness Scale Score		Workload Scale Score	
	n	M±SD	p	M±SD	p
Gender					
Female	93	2.87±0.52	**0.018***	5.04±1.18	0.560
Male	45	3.01±0.42		4.96±1.16	
Educational Status					
Health vocational high School	5	3.05±0.57		5.16±0.68	
Associate degree	11	2.87±0.38	0.809	4.32±1.40	0.242
Bachelor's degree	104	2.92±0.52		5.06±1.19	
Master's degree	18	2.89±0.41		5.12±0.91	
Marital Status					
Married	76	2.96±0.44	0.151	4.87±1.23	0.06
Single	62	2.87±0.55		5.19±1.08	
Family Type					
Nuclear	114	2.92±0.48		5.03±1.16	
Extended	17	2.92±0.58	0.642	4.81±1.38	0.807
Single Parent	7	2.83±0.56		5.34±0.74	
Work Shift					
Day	12	3.01±0.29		5.03±0.95	
Night	4	2.91±0.50	0.354	5±1.21	0.723
Day/Night	122	2.97±0.71		5.35±0.78	
Following publications related to the profession					
Yes	37	2.97±0.60	0.813	5.17±0.98	0.802
No	101	2.90±0.45		4.96±1.24	
Following current Professional information on the internet					
Yes	103	2.93±0.54	0.543	5.08±1.13	0.382
No	35	2.86±0.34		4.83±1.29	
Believing in the necessity of innovative approaches in nursing					
Yes	127	2.90±0.50		5.05±1.13	
No	2	2.83±0.07	0.251	3.5±0.70	0.161
Undecided	9	3.16±0.40		4.91±1.62	

n: number of participants; *M*: Mean; *SD:* standard deviation

An inverse relationship was found between the participants' workload scores and their individual innovativeness scores (r =- 0.230, p=0.007). According to this result, as the workload of the participants increases, individual innovativeness decreases. An inverse relationship was found between the workload and age of the participants (r =- 0.229 p=0.007). There was a decrease in the workload score as the age of the participants increased. No correlation was found between the number of children, total years worked, total years worked in the ICU, hours worked per week, and internet usage of the participants (Table II). The mean score of the participants on the Workload Scale was 5.00±1.17, and the total mean score on the IIS was 2.94±0.44.

Table II. Relationship Between Individual Innovativeness Scale in Nursing Profession, Workload Scale Sub-Dimensions and Descriptive Characteristics of the Participants

	Workload Scale Total Score		
	M±SD	r	p
IIS total score	2.94±0.47	-0.230	**0.007***
IIS sub dimensions			
Opinion leadership	2.64±0.77	-0.125	0.144
Resistance to change	3.44±0.79	-0.131	0.127
Risk taking	2.50±0.86	-0.114	0.182
Demographic characteristics of the participants			
Age	32.89±8.29	-0.229	**0.007***
Number of children	1.02±0.96	-0.129	0.133
Years worked	9.6±8.16	-0.166	0.052
Years worked in the ICU	4.64±4.5	-0.107	0.210
Hours worked per week	52.71±9.76	-0.046	0.589
Duration of internet usage per day	4.97±3.19	0.045	0.597

IIS: Individual Innovativeness Scale in Nursing Profession; *M*: Mean; *SD*: standard deviation; *r*: correlation; (r<.05; poor relationship, .50<r<.70; moderate relationship, r≥.70; strong relationship), Statistically significant values (p <.05) are shown in bold.

According to the IIS, 2.2% (n=3) of the participants were innovators, 0.7% (n=1) pioneers, 4.3% (n=6) interrogators, 13.8% (n=19) skeptics, 79% (n=109) traditionalists. A difference was found between the workload and the participants' IIS innovative sub-dimension scores (p=0.012). This difference was found between those who were innovative and skeptical (p=0.033). The workload of the innovators (6±0.00) was higher than the skeptics (4.27±1.52) (Table III).

Table III. Comparison of IIS subdimensions and Workload Scale

		Workload Scale Score	
IIS subdimension	n	Mean±SS	p
Innovators	3	6±0.00*	
Pioneer	1	5±-	0.012
Interrogator	6	5±0.63	
Skeptical	19	4,27±1.52*	
Traditional	109	5,12±1.10	

IIS: Individual Innovativeness Scale in Nursing Profession; n: number of participants; M: Mean; SD: standard deviation; Statistically significant values (p <.05) are shown in bold.

DISCUSSION

High expectations of the service recipients in the field of health, the need to adapt to information and technology, competition and the costs in the health care industry make innovation necessary in the nursing profession. In addition, the increase in workload, insufficient number of employees and institutional policies may affect the intensive care approach. The starting point of our study was to determine the effect of the workload on the innovative approaches of intensive care nurses and the affecting factors. In our study, the workload of intensive care nurses was high, and their IIS scores were low. An inverse relationship was found between intensive care nurses' workload score and IIS. As the workload of the participants increased, their individual innovativeness attitudes decreased. In his thesis study with 132 nurses, Chheda (2020) stated that there is a non-significant nonlinear relationship between workload and innovation and that nurses perceive the workload as a daily event, a normal part of the job (7).

In the study, in which the workload of nurses in the intensive care unit was evaluated prospectively in 16 hospitals, it was determined that the workload increased with the increase in the duration of care when death occurred, according to shifts worked (19). The workload negatively affects the behavior and performance of nurses in the workplace and innovative attitude (20, 21). It can be assumed that the high number of patients per nurse in Turkey increases the workload and negatively affects individual innovative behavior.

The IIS scores of men were significantly higher than the women. In a study conducted by Polster and Villines in 2017 with nurses (n=217) using IIS, personal innovativeness did not differ according to gender (13). In a study conducted with intensive care nurses in Iran, there was no significant relationship between gender and the mean workload score where the mean workload score of intensive care nurses was high (22). The fact that men are more innovative than women in our study may be due to sample selection, regional, cultural and country-based differences. In our study, there was an inverse relationship between the workload and age of the participants as the age increased the workload score decreased. In a study conducted with intensive care nurses (n=82), no significant relationship was found between age and workload. The workload was higher if a nurse cared for more than one patient, and dying patients (23). In studies stated that nursing practices are of critical importance in providing quality health care in intensive care units, but quality varies depending on several factors such as work environment, workload, and personnel training (24, 25).

Similarly, in the study conducted with intensive care nurs es in Iran, there was no significant relationship between the average workload score and age, and the workload average score of the intensive care nurses was high (22). Unlike other studies conducted, in our study with the increase in the age of intensive care nurses, their professional experience increases, and they can manage their time better during the patient care process.

According to the IIS, few of the intensive care nurses (2.2%) were found to be innovative and the majority (79%) traditionalist. Polster and Villines found a high level of innovativeness (90.3%) in a study conducted with nurses (n=217) using IIS in 2017 (13). In another study, the innovative behaviors of the nurses in charge and the nurses working in the intensive care units were at a moderate level (26, 27). In another study conducted with nurses (n=322), it was determined that a pro-innovation organizational climate had a significant and positive effect on both autonomy and innovation attitude, but the innovative behavior scores of the participants were found to be low (28).

In a study conducted with nurses in China, innovation behavior scores were low, and the nurses tended to adopt innovative behavior with the support of the organizations they work for (15). Bahari et al., (2021) state that nurses' technological creativity and openness to innovation contribute to solving patients' health problems and work-related difficulties, improving management performance and ensuring patient well-being (29). Traditionalist individuals tend to be skeptical of innovations and change according to their personality traits, and they hardly adopt an innovation (30). Our results reveal that nurses have a traditionalist attitude towards innovations, and it is difficult for them to be included in change and innovations.

A difference was found between the innovativeness of the nurses working in the intensive care unit in terms of workload (p=0.012). This difference was between those who were innovative and skeptical (p=0.033). Workload of those who were innovative (6±0.01) was higher than those who were skeptical (4.27±1.52). In the thesis study conducted with nurses (n=132), the workload of the participants was high, and their level of innovation was moderate (7). In a study conducted in France, nurses' workload average score was found to be high (31). A study conducted with nurses working in a university hospital in Egypt revealed that the majority (49.4%) had low perceptions of workload (32). In the results of his study, Chheda (2020) emphasized that the workload contributes from time to time as an element that supports creativity and innovation in improving the working conditions and the performance of nurses, and that the workload should not always be considered as a bad condition (7). Although there is a limited number of studies on this subject in the literature, no research with intensive care nurses has been found. These results are similar to our study, it can be said that workload can increase innovation. Nurses who are not very open to innovation and who are skeptical of innovation have less workloads and are less open to innovations.

Limitations

This study was conducted in all the intensive care units of a single city hospital. This situation limits the generalizability of our research findings only to similar groups. Another limitation of the study is that this study did not try to explore the environmental factors that may affect workload and the level of individual innovativeness in detail with more detailed questions.

CONCLUSION

The results of our study revealed that the workload of intensive care nurses was high and most of them had a traditional attitude towards innovation. Inclusion of new ideas in daily nursing care in ICUs and their adoption by professionals will contribute positively to professional development and care quality. In this context, the acceptance of innovative ideas to reduce the workload of intensive care nurses and care provided will reflect positively on the quality of care provided.

Ethics Committee Approval:
This research complies with all the relevant national regulations, institutional policies and is in accordance with the tenets of the Helsinki Declaration, and has been approved by the Faculty of Medicine Non-Invasive Clinical Research Ethics Committee, Mersin University (approval number: 66 date: 20/01/2021).

Informed Consent:
All the participants' rights were protected and written informed consents were obtained before the procedures according to the Helsinki Declaration.

Author Contributions:
Concept – M.T.I., R.C.Ö.; Design – M.T.I.,R.C.Ö.,V.D.; Supervision – M.T.I, R.C.Ö; Resources – M.T.I.,V.D., R.C.Ö., S.E.E.; Materials -.; Data Collection and/or Processing - M.T.I.,V.D., R.C.Ö.; Analysis and/ or Interpretation - M.T.I., S.E.E.; Literature Search - M.T.I.,V.D., R.C.Ö., S.E.E; Writing Manuscript - M.T.I.,R.C.Ö.; Critical Review - M.T.I.,V.D., R.C.Ö., S.E.E.

Conflict of Interest:
The authors have no conflict of interest to declare.

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