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Determination of Nursing-Sensitive Indicators for Intensive Care Units in Turkey: A Qualitative Study

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ABSTRACT

Assessment of the quality of health services continues to be one of the top research areas from past to present. The development of nursing-sensitive indicators is one of the critical elements in assessing the quality of nursing care. This study aims to determine the nursing-sensitive indicators for intensive care units. This research was conducted between May 2017 and October 2017 using a descriptive qualitative research phenomenological design. The research was assessed by the qualitative research paradigm based on Consolidated Criteria for Reporting Qualitative Research (COREQ). Ethics committee approval of the study and written permissions from the selected hospitals were obtained. The research was performed with in-depth face-to-face interviews with 12 participants from three different hospitals and nursing education institutions through a semi-structured interview form. During the interviews, voice recordings were taken with prior permission, and the recordings obtained were deciphered word by word and evaluated with content analysis. As a result of the research, four main themes were created; the patient-focused outcome indicators, the nurse-focused outcome indicators, the nursing-focused process/intervention indicators, and the organizational-focused structural indicators. Under these main themes, nursing-sensitive indicators have been determined. Nosocomial infections and pressure ulcers were the two-leading nursing-sensitive indicators. This research suggests developing policies and procedures for forming a national database specific to nursing, including nursing-sensitive indicators.

Keywords: Intensive care, nursing, nursing-sensitive indicator.

Türkiye'deki Yoğun Bakım Ünitelerine Yönelik Hemşirelik Bakımına Duyarlı Göstergelerin Belirlenmesi: Nitel Bir Çalışma

ÖZ

Sağlık hizmetlerinin kalitesinin değerlendirilmesi geçmişten günümüze kadar en önemli araştırma alanlarından biri olmaya devam etmektedir. Hemşirelik bakımına duyarlı göstergelerin geliştirilmesi, hemşirelik bakımının kalitesini değerlendirmede kritik unsurlardan biridir. Bu çalışma, yoğun bakım üniteleri için hemşirelik bakımına duyarlı göstergeleri belirlemeyi amaçlamaktadır. Bu araştırma, tanımlayıcı nitel araştırma fenomenolojik deseni kullanılarak Mayıs 2017 - Ekim 2017 tarihleri arasında gerçekleştirilmiştir. Araştırma, Nitel Araştırma Raporlama için Konsolide Kriterlere (Consolidated Criteria for Reporting Qualitative Research - COREQ) dayalı

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nitel araştırma paradigması ile değerlendirilmiştir. Çalışma için etik kurul onayı ve seçilen hastanelerden yazılı izinler alınmıştır. Araştırma, yarı yapılandırılmış görüşme formu aracılığıyla üç farklı hastane ve hemşirelik eğitim kurumundan 12 katılımcı ile yüz yüze derinlemesine görüşme yöntemiyle gerçekleştirilmiştir. Görüşmeler sırasında önceden izin alınarak ses kayıtları alınmış, elde edilen kayıtlar kelime kelime deşifre edilerek içerik analizi ile değerlendirilmiştir. Araştırma sonucunda hasta odaklı sonuç göstergeleri, hemşire odaklı sonuç göstergeleri, hemşirelik odaklı süreç/girişim göstergeleri ve organizasyon odaklı yapı göstergeleri olmak üzere dört ana tema oluşturulmuştur. Bu ana temalar altında hemşirelik bakımına duyarlı göstergeler belirlenmiştir. Hemşirelik bakımına duyarlı ilk iki en önemli gösterge; hastane enfeksiyonları ve bası yaraları olarak tespit edilmiştir. Sonuçlara dayanılarak, Türkiye'ye özgü hemşirelik bakımına duyarlı göstergeleri içeren, hemşireliğe özgü ulusal veri tabanı oluşturulmasına yönelik politika ve prosedürlerin geliştirilmesi önerilmiştir.

Anahtar Kelimeler: Yoğun bakım, hemşirelik, hemşirelik bakımına duyarlı gösterge.

1 Introduction

Evaluation of health care quality continues to be one of the essential research areas from past to present. Nurses are health professionals who can best judge the patient's condition and are in uninterrupted connection with the patient for 24 hours. Therefore, the quality of health care is directly related to nursing care [1]. However, data specific to nursing care are not considered sufficiently during the evaluations of health institutions or in the creation of health policies. The most important reasons for cannot seeing the value of nursing care consist of the following; the inability to measure the contribution of nursing care in the health care system, the inadequacy of information systems that can display nursing care data, and the absence of a standard language in nursing. Therefore, it is necessary to portray more comprehensively and accurately what nurses do and to show the value and benefits of the services they provide [1,2].

It is essential to develop and apply nursing-sensitive indicators to evaluate the quality of nursing care [3]. Nursing-sensitive indicators show the value of nursing care by measuring patient care and patient outcomes directly affected by nursing practices [4]. Nursing-sensitive indicators are becoming more valid, reliable, and usable criteria by providing objective measurement possibilities, improving clinical practices, evaluating the quality of nursing care, and providing comparison opportunities in choosing similar hospitals [5]. Supporting the outcomes of nursing-sensitive care with experimental studies demonstrates the evidence-based outcomes of nursing, thus increasing the visibility of nursing. Without evaluation indicators, improvement cannot be expected [6]. In order to measure and standardize nursing care, community-specific care indicators should be determined [3].

Intensive care unit (ICU)s are among the most required areas to determine the nursing-sensitive indicators. Since ICUs serve sensitive nursing care for patients with high severity who are commonly unconscious or bedridden. For this reason, ICUs are one of the most preferred units that reflect patient outcomes [7].

There are studies from different countries on nursing-sensitive patient outcomes in the literature to make nursing care visible [8-13]. However, it is noteworthy that there is an important gap in this subject area in Turkey. The number of nurses in Turkey represents 30.1% of the total health personnel and constitutes the largest workforce share in the health sector. Furthermore, Turkey's total intensive care bed capacity is 48.753, and nursing care activities are mainly performed in ICUs [14]. Despite that, research aimed at making nursing care visible generally consists of survey studies that examine a single level and focus on nurses' or patients' descriptive characteristics of nurses or patients [15-18]. This study was conducted to determine the nursing-sensitive indicators for ICUs.

2 Methodology

This research was performed using a descriptive phenomenological design in the qualitative research methods.

2.1 Study Population and Sample

Although there is no definite rule regarding the number of people included in the qualitative research, we aimed to reach data saturation through in-depth interviews. In qualitative research, selecting individuals to be interviewed was checked whether they were directly related to the research subject rather than their power to represent the universe [19]. This research aims to determine a working group that can be a rich source of information about the study subject, working in institutions with different functioning and cultures, and that can directly impact nursing care. For this purpose, the research study group consisted of individuals with knowledge and experience about the study subject, determined by using the maximum diversity method, one of the purposeful sampling methods. The participants consisted of ICU nurses working in a public, a university, and a private hospital, ICU specialist and nursing academics specializing in intensive care in Ankara. The high bed capacity of ICU was considered in the selection of the hospital. The interviewees consisted of three ICU manager nurses, three ICU nurses, and three ICU specialist who have worked in ICUs for at least one year from three different hospitals. In addition, three nursing academics have studied intensive care were included in the interviewees (n=12). Qualitative data included semi-structured interviews obtained from interviewers with a purposive sample.

2.2 Data Collection Forms

Qualitative data were collected using the “Descriptive Characteristics Determination Form” and “Interview Form Regarding Nursing Care”, which were created using the data collection scientific literature. Descriptive Characteristics Determination Form: Individuals include question about age, gender, and professional experience. It has been prepared separately for three groups: academicians, nurses, and specialists. Interview Form Regarding Nursing Care: This form consists of semi-structured open-ended different questions to determine the current evaluation of nursing care activities, deficiencies of these methods, and nursing care indicators. Interview Form Regarding Nursing Care was prepared separately for three main groups; academicians, nurses (unit manager nurse and unit nurse), and specialists in Table 2. The form includes five open-ended questions for academicians, 10 for nurses, and six for specialists. Questions include the meaning of the evaluation of nursing care, evaluation criteria and its importance, the importance of the unit studied, how the evaluation is done, the problems experienced during the evaluation, the strengths and weaknesses of the evaluation process, the effects of the evaluation on the professional development, the patient care quality, the institution, and opinions and suggestions. For the content validity of the questions, expert opinion was taken from three nurse faculty members and a preliminary application was made with two nurses who were not included in the study group.

2.3 Data Collection

This research was conducted between May 2017 and October 2017, based on the 32-item Consolidated Criteria for Reporting Qualitative Research (COREQ) [20], which guides qualitative studies. The data were collected using an in-depth face-to-face interview method accompanied by a semi-structured interview form. Before the interview, the participants were informed by their written consent about the research purpose and goals. Interviews were held in the nurses' rooms and specialists' rooms on the convenient days and hours for the participants who accepted to be interviewed. With the permission of the participants, the interviews were audio-recorded. However, two participants did not approve of the audio recording. Thus, these two interviews were recorded in written form. The interviews lasted an

average of 40-45 minutes.

2.4 Statistical Analysis

All data were analyzed by the qualitative data analysis software program JMP, Version 16 Pro (SAS Institute Inc., Cary, NC, USA, 1989–2021). The data obtained by the in-depth interview technique were analyzed according to content analysis, one of the systematic qualitative data analysis methods. Content analysis requires an in-depth analysis of the collected data and enables previously obscure themes and sub-themes to be revealed. During the data coding, the first stage of the content analysis, the codes seen in Table 1 as 'indicators' were created. For this purpose, the expressions written in the data set were examined repeatedly, and the same, similar, and different expressions were grouped. The second stage includes thematic coding, sub-themes that can explain the data at a general level, and collecting the codes under sure umbrellas were created using the codes that emerged in the first stage. These sub-themes are expressed as 'categories' in Table 1. Finally, the main themes based on the literature were created using the determined sub-themes [21-24]. The main themes are expressed as 'dimensions' in Table 1. Since the sub-themes were created from the codes, it was possible to represent all the thoughts and interpretations that emerged during the interview without adopting a "reductionist" attitude. The data analysis process makes progress from data to concepts. After the data were organized according to codes and themes, the findings were interpreted. Thus, the collected data was given meaning, the relationships between the findings were explained, cause and effect relationships were established, and results were created from the findings. The first researcher carried out all steps of data analysis. In order to ensure the reliability of the research and reduce the risk of bias, the data was reviewed by the second researcher, a nursing academic who is an expert and has training and publications on qualitative research. The data were evaluated independently by both researchers. After the themes were created, a common consensus was reached. Four main themes and 19 sub-themes were identified in the content analysis (Table 1).

3 Results and Discussion

Regarding the participants' socio-demographic characteristics, 83.3% were female, and their mean age was 39.58±9.47. The participants' average number of years of professional experience was 15.5±7.45, and the average of intensive care years of experience was 9.58±5.26. All academics and specialists graduated from the doctoral level education program, and all nurses graduated from the undergraduate program.

As a result of the data analysis obtained from face-to-face in-depth individual interviews, nursing-sensitive indicators with high frequency were illustrated in the word cloud graphics based on the number of participants (NoP) and keyword frequency (KF). The higher frequent words and phrases in word clouds are represented as a larger size. Based on the number of participants, nosocomial infection, pressure ulcers, patient falls, education-orientation, and patient mobilization come to the fore in the word cloud graph (Figure 1).

Figure 1: Term distribution by number of participants

CRBSI: Catheter-Related Bloodstream Infections, UTI: Urinary Tract Infection, MAE: Medication Administration Error, DVT: Deep Venous Thrombosis. The larger letter size indicates a higher frequency of the term.

The word cloud graph (Figure 2) obtained based on keyword frequency indicates that nosocomial infection, medication administration errors (MAE), pressure ulcer, education-orientation, care performance, and patient falls come to the fore.

Figure 2: Term distribution by keyword frequency

CRBSI: Catheter-Related Bloodstream Infections, UTI: Urinary Tract Infection, MAE: Medication Administration Error, DVT: Deep Venous Thrombosis. The larger letter size indicates a higher frequency of the term.

Within the scope of the research, sub-themes of each nursing-sensitive indicator specific to ICUs were created. Based on the model of Donabedian, the National Quality Forum, the framework of the American Nurses Association, and a systematic review of 144 observational studies examining the relationships between nurses and patient outcomes between 1997 and 2017 were used to establish the main themes as structure, process, and outcome indicators [21-24]. The main themes express the dimensions of nursing-sensitive indicators specific to ICUs, and the sub-themes express categories and indicators. Dimensions consist of four groups; patient-focused outcome dimension, nurse-focused outcome dimension, nursing-focused process/intervention dimension, and organizational-focused structural dimension. Patient-focused outcome dimension includes nosocomial infections, MAE, pressure ulcer, patient falls, mortality, patient/family satisfaction, deep venous thrombosis (DVT), length of stay (LOS), physical restraint use, and other indicators (central nervous system diseases, unspecified complications, post-

operative respiratory failure, gastrointestinal system bleeding, atelectasis, and hypothermia). The nurse-focused outcome dimension consists of nurse satisfaction and nurse injury rate indicators. The nursing-focused process/intervention dimension covers patient communication and education, maintenance of skin integrity (MSI) interventions, pain management interventions, and patient safety interventions. Finally, the organizational-focused structural dimension includes four categories; administrative, nurse staff, financial, and environmental (Table 1).

Table 1: Distribution of Nursing-Sensitive Dimensions, Categories, and Indicators

Dimensions (Main Themes)	Categories (Sub-themes), Indicators (Codes)	Keyword		Participant
		Frequency	%	Count
1-Patient-Focused Outcome	1- Nosocomial infection	**70**	**31.5**	**12**
	General/Unspecified infection	*36*	*51.4*	*12*
	CRBSI	*11*	*15.7*	*4*
	Respiratory tract infection	*9*	*12.9*	*4*
	Pneumonia	*7*	*10*	*4*
	UTI	*6*	*8.6*	*4*
	Sepsis	*1*	*1.4*	*1*
	2- MAE	**35**	**15.8**	**6**
	3- Pressure ulcer	**32**	**14.4**	**12**
	4- Patient falls	**23**	**10.4**	**10**
	5- Mortality	**13**	**5.9**	**4**
	6- Patient/Family satisfaction	**10**	**4.5**	**7**
	7- DVT	**7**	**3.1**	**4**
	8- LOS	**5**	**2.3**	**2**
	9- Others	**27**	**12.1**	**3**
	Central nervous system diseases	*9*	*30*	*3*
	Unspecified complications	*8*	*26.6*	*2*
	Post-operative respiratory failure	*5*	*16.7*	*3*
	Gastrointestinal system bleeding	*2*	*6.7*	*1*
	Atelectasis	*2*	*6.7*	*2*
	Hypothermia	*1*	*3.3*	*1*
2-Nurse-Focused Outcome	10- Nurse job satisfaction	**7**	**70**	**3**
	11- Nurse injury rate	**3**	**30**	**1**
3-Nursing-Focused Process/Intervention	12- Patient communication and education	**54**	**39.7**	**5**
	13- MSI interventions	**37**	**27.2**	**9**
	14- Pain management interventions	**25**	**18.4**	**6**
	15- Patient safety interventions	**20**	**14.7**	**6**
4-Organizational-Focused Structural	16- Administrative categories	**81**	**51.3**	**8**
	Managerial factors	*32*	*39.5*	*6*
	Nurse authority and responsibility	*13*	*16*	*5*
	Multidisciplinary work	*11*	*13.6*	*5*
	Workplace physical conditions	*10*	*12.3*	*4*
	Number of beds	*7*	*8.6*	*3*
	Maintenance support systems	*6*	*7.4*	*2*
	Nurse working hours	*2*	*2.5*	*1*
	17- Nurse staff categories	**64**	**40.5**	**10**
	Nurse education	*50*	*78.1*	*9*
	Ratio of patients per nurse	*8*	*12.5*	*5*
	Year of nurse experience	*4*	*6.3*	*3*
	Number of nurses	*1*	*1.6*	*1*
	Number of nurses with undergraduate	*1*	*1.6*	*1*
	18- Financial categories	**9**	**5.7**	**1**
	Cost	*8*	*88.9*	*1*
	Paying system	*1*	*11.1*	*1*
	19- Environmental categories	**4**	**2.5**	**2**
	Residential area	*4*	*100*	*2*

CRBSI: Catheter-Related Bloodstream Infections, UTI: Urinary Tract Infection, MAE: Medication Administration Error, DVT: Deep Venous Thrombosis, LOS: Length of Stay, MSI: Maintenance of Skin Integrity.

The study group's content analysis findings were examined hierarchically from dimensions to indicators. Findings are reported based on keyword frequency (KF) and the number of participants (NoP).

In Table 1, the top categories under the patient-focused outcome dimension were nosocomial infections

(KF: 70, NoP:12) and pressure ulcers (KF: 32, NoP:12). Conversely, the least emphasized patient-focused outcome dimension was LOS.

The participants only referred to nurse satisfaction and nurse injury rate indicators within the nurse-focused outcome dimension scope. MSI interventions (NoP: 9) and patient communication and education (KF: 54) were more emphasized indicators in the nursing-focused process/intervention dimension. The nurse staff categories (NoP:10) and administrative categories (KF:81) were leading indicators in the organizational-focused structure dimension.

Table 2: Percentage Distribution of Categories and Indicators in Nursing-Sensitive Dimensions by Occupational Position Variable

Dimensions	**Categories, Indicators**	**Academician (%)**	**Unit Manager Nurse (%)**	**Unit Nurse (%)**	**Specialist (%)**
Patient-Focused Outcome	Nosocomial Infections	0.25	0.38	0.50	0.22
	Pressure Ulcer	0.12	0.17	0.17	0.17
	Patient Falls	0.10	0.10	0.07	0.17
	Patient/Family Satisfaction	0.01	0.03	0.07	0.28
	MAE	0.21	0.17	0.03	----
	Mortality	0.09	0.02	----	0.11
	DVT	0.03	0.05	0.03	----
	LOS	0.01	0.02	----	----
	Others	0.18	0.06	0.13	0.05
Nurse-Focused Outcome	Nurse Job Satisfaction	----	----	1.00	0.63
	Nurse Injury Rate	----	----	----	0.37
Nursing-Focused Process/Intervention	MSI Interventions	0.16	0.38	0.40	0.25
	Pain Management Interventions	0.13	0.24	0.30	----
	Patient Safety Interventions	0.19	0.11	0.10	----
	Patient Communication and Education	0.52	0.27	0.20	0.75
Organizational-Focused Structural	Nurse Staff Categories	0.23	0.61	0.73	0.62
	Administrative categories	0.66	0.28	0.27	0.38
	Environmental Categories	0.01	0.11	----	----
	Financial Categories	0.10	----	----	----

MAE: Medication Administration Error, DVT: Deep Venous Thrombosis, LOS: Length of Stay, Others: Central Nervous System Diseases, Unspecified Complications, Post-Operative Respiratory Failure, Gastrointestinal System Bleeding, Atelectasis, Hypothermia, MSI: Maintenance of Skin Integrity.

In Table 2, Academics and nurses mainly referred to nosocomial infections, whereas specialists emphasized patient/family satisfaction in the patient-focused outcome dimension. Service nurses did not cite mortality rate and LOS, and specialists did not refer to MAE, DVT, and LOS. Only service nurses and specialists cited nurse satisfaction in the nurse-focused outcome dimension. In terms of the nursing-focused process/intervention dimension, academics and specialist mainly emphasized patient communication, while nurses emphasized the MSI interventions.

Table 3: Percentage Distribution of Categories and Indicators in Nursing-Sensitive Dimensions by Year of Experience Variable

Dimensions	**Categories, Indicators**	**5 years and below (%)**	**6-10 years (%)**	**11-15 years (%)**	**16-20 years (%)**	**21 years and above (%)**
Patient-Focused Outcome	Nosocomial Infections	0.27	0.30	0.35	0.47	0.17
	Pressure Ulcer	0.27	0.06	0.12	0.18	0.17
	Patient Falls	----	0.06	0.10	0.06	0.14
	Patient/Family Satisfaction	0.10	0.02	0.07	----	0.03
	MAE	----	0.13	0.14	----	0.23
	Mortality	----	0.02	0.04	----	0.13
	DVT	----	0.13	0.15	0.24	0.06
	LOS	----	0.02	0.01	----	----
	Others	0.36	0.26	0.02	0.05	0.07
Nurse-Focused Outcome	Nurse Job Satisfaction	1.00	1.00	0.84	----	----
	Nurse Injury Rate	----	----	0.16	----	----
Nursing-Focused Process/Intervention	MSI Interventions	0.57	0.27	0.33	0.25	0.15
	Pain Management Interventions	0.22	0.39	0.22	0.50	0.04
	Patient Safety Interventions	----	0.07	0.15	----	0.23
	Patient Communication and Education	0.21	0.27	0.30	0.25	0.58
Organizational-Focused Structural	Nurse Staff Categories	1.00	0.17	0.59	1.00	0.28
	Administrative categories	----	0.83	0.35	----	0.61
	Environmental Categories	----	----	0.06	----	0.01
	Financial Categories	----	----	----	----	0.10

MAE: Medication Administration Error, DVT: Deep Venous Thrombosis, LOS: Length of Stay, Others: Central Nervous System Diseases, Unspecified Complications, Post-Operative Respiratory Failure, Gastrointestinal System Bleeding, Atelectasis, Hypothermia, MSI: Maintenance of Skin Integrity.

In Table 3, Whereas the participants with 15 years or less of experience more emphasized nurse satisfaction, the participants with ten years of experience or less referred to nurse satisfaction in the nurse-focused outcome dimension. On the other hand, while participants with 11-15 years of experience referred to the nurse injury rate, the participants with 16 years or more of experience did not make any assessment in the nurse-focused outcome dimension.

Below are the remarkable statements about the subject reported by the participants during the in-depth interview.

Participants especially drew attention to the importance of nursing care. Examples of expressions related to this are as follows.

"I can see the results of my undergraduate education with the care that I performed ……, the care is the most valuable nursing asset that we need to think about and research in detail" (Nurse-2).

"I remember two of our patients, whom we thought would not get better…… as a specialist group, we did not have any hope for the patients, but we saw that these patients …… got better after a while. So that is completely a result of nursing care, we quitted. However, the nursing care continued with full support, and these two patients improved excitingly. That was the success of nursing care and therefore is very important" (Specialist -3).

Participants also drew attention to the visibility of nursing care. Examples of expressions related to this are as follows.

"Unfortunately, for nurses in our country, ……. that they can at least concretely measure, see, record their practices for the answer to the question of what a nurse does ……. there is no system" (Academician-1).

"To see nursing care, it is necessary to look at the effect of care on patient outcomes" (Academician-2).

"The correct and necessary care is the visible face of our professional ……. In other words, we are obliged to show ourselves to explain what we do as nurses and be understood" (Nurse-2).

"If some criteria are corrected, nursing can be made visible and become a high-quality profession in terms of image. We need to be able to show ourselves, for this we have to show the society what nurses do" (Nurse-3).

Participants also drew attention to the evaluation of nursing care. Examples of expressions related to this are as follows.

"Concrete results enable the evaluation of nursing care and nursing performance. When the care is performed, deficiencies or mistakes can only be discussed, and improvements can only be available because nothing can be evaluated without measured……" (Academician-3).

"If the concept of care is fundamental, its evaluation for nursing is also essential. Without evaluation, we cannot understand how we care, or we cannot make progress, we cannot see our mistakes" (Unit Manager Nurse-1).

This study determined nursing-sensitive indicators for ICUs through in-depth interviews with a specific study group. All participants drew attention to nosocomial infections and pressure ulcers. In addition, nosocomial infections listed in the patient-focused outcome dimension were the most emphasized category. Chen et al. (2016) studied indicators of nursing quality care in ICUs. They determined that several indicators can be considered significant: nosocomial infection, accidental endotracheal extubation, MAE, pain management, peripheral venous extravasation, compliance with handwashing techniques, pressure ulcers, and ICU experience [25]. Chen et al. (2016) findings show consistent results with our study.

In terms of the patient-focused outcome dimension; respectively nosocomial infections, pressure ulcers, and patient falls are the first three critical indicators-based number of participants. Consistent with pressure ulcers, MSI interventions was the most critical indicator in the nursing-focused process/intervention dimension. Therefore, prioritizing pressure ulcers and patient fall indicators directly related to nursing interventions in Turkey is crucial. This finding can be considered a result of efforts to use pressure ulcers and patient fall scales as a part of health policies regarding stoma and wound care nursing since the beginning of the 2000s in Turkey [26]. In the literature, nosocomial infections and mortality have been examined as the most studied nursing care indicators [9,11,13].

Few efforts examine Turkey's nurse variables, patient, nurse, and administrative outcomes. On the other hand, existing studies consist of survey studies that examine a single level and focus on the descriptive characteristics of nurses or patients. Most studies related to patient outcomes in the Turkish literature were on medical errors. Seren İntepeler et al. (2014) examined trends in MAEs. They determined that the institution, shift, and work hours affected MAE tendency [15]. Similarly, few studies emphasize the effect of MAE on nursing care [15,16,18]. On the contrary, Ergan et al. (2016) examined the relationship between nurse workload and intensive care mortality rate but did not find a direct effect of workload on mortality rate [17]. Another study showed a statistically significant difference between the organizational structure-related factors such as nurse age, clinic experience, working hours and the number of patients per nurse, and the practice of nursing interventions to prevent falls [27].

This study indicated that nurses intensively emphasized the process indicators. This finding can be explained by nurses' perception of intervention practices due to the intervention-focused work. In particular, the fact that the service nurses never cited the mortality and LOS suggests assuming no nurse effect on these variables. Another remarkable finding of this study showed that while the unit manager nurse never referred to nurse satisfaction, all service nurses emphasized nurse satisfaction. Few efforts also exhibited that nurses in managerial positions had higher job satisfaction [28]. Our study showed that participants referred to only nurse satisfaction and nurse injury rate as nursing indicators under the nurse-focused outcome dimension. Although none of the participants cited nurse turnover and nurse burnout, these indicators relate to nursing satisfaction and cannot be ignored. However, although the sample size limitations can justify the fact that few participants never referred to the nurse injury rate, this finding still needs to be supported by further studies. This study indicated that participants with ten years or less of working experience emphasized nurse satisfaction while five years or less of work experience emphasized the nursing indicators belonging to the nurse personnel category. Confirming our findings, Aydoğmuş (2017) found that nurses with five years or less of hospital experience, working in shifts and working more than 41 hours per week, had a high intention to leave [29].

The participants with 16 years and more experience never referred to nurse satisfaction. This finding may suggest that they became desensitized due to accepting the situation and losing intention to change it. In addition, this finding can be interpreted that gaining experience in professional adoption, acceptance, adaptation, and coping with stress with years of experience can reduce burnout. Similarly, other studies have determined that nurses working longer in the profession had low emotional exhaustion and high depersonalization [30]. Increasing in working years, the development of professional commitment, professional adoption, adaptation to work conditions, and the ability to cope with stress may reduce professional burnout.

During the interviews, unidentified nosocomial infections and complications, administrative categories, financial categories, and environmental categories by the interviewees were considered in general, and a measurable criterion size could not be reached. Interviewer statements about patient communication and education, MSI interventions, pain management interventions, and patient safety interventions under the nursing-focused process/intervention dimension were defined by general statements rather than measurable indicators. This finding can be explained by process-focused indicators examined in process management studies rather than empirical studies.

4 Conclusion

In this study, nursing-sensitive indicators that could be used in ICUs were determined through content analyses with in-depth interviews with 12 expert participants. Nursing-sensitive indicators were evaluated in four main dimensions; patient-focused, nurse-focused, nursing-focused process/intervention, and organizational-focused structural. The participants emphasized the patient-focused outcome dimension the most and the nurse-focused outcome dimension the least. As a result of the content analysis, nosocomial infections and pressure ulcers in the patient-focused outcome dimension were the first two leading nursing-sensitive indicators emphasized by all participants. In addition, the participants' statements about nursing care visibility, significance, and evaluation were remarkable. Based on the results of the study, the following suggestions were presented to Determination of Nursing-Sensitive Indicators for Intensive Care Units. There is a niche to develop policies and procedures to create a national nursing database containing ICU nursing-sensitive indicators. Establishing a standard language on this subject in Turkey will enable monitoring and comparing the quality of ICUs in different locations throughout the country. In addition, by creating the database available to researchers, quality efforts will be developed, and an opportunity for national/international comparison will arise. This study provides scientific evidence for the determination of nursing-sensitive indicators and draws attention to the importance of the subject. However, this study has limitations

regarding small sample size, minimal generalization, and opinion-based. Moreover, the lack of available nursing practice data restrains examining the real effects of nursing-sensitive indicators on nursing care. Therefore, further studies on measuring the determined indicators are needed.

5 Declaration

5.1 Limitations

This research was limited to nurses, unit manager nurses, and specialists working in ICUs of a public, a university, and a private hospital within the scope of inpatient treatment institutions in Ankara, and academicians of the nursing department who have scientific studies on these units. Therefore, the research results are limited to the views of the determined study group during the time period of the study and cannot be generalized.

5.2 Acknowledgement

We would like to thank all the participation who participate in the study.

5.3 Conflict of Interest

There is no conflict of interest in this study.

5.4 Author Contribution

Corresponding Author Beratiye ÖNER: Writing the main text of the article, literature review, creating the titles, proposal for a common idea, produced from the doctoral thesis and is the author in the thesis.

Ayişe KARADAĞ: She is the advisor in the thesis, which is the common idea suggestion and consultancy, doctoral thesis advisory.

6 Human and Animal Related Study

6.1 Ethical Aspects

The study was produced from the first phase of the first author's three-stage doctoral thesis named “Determination of Nursing-Sensitive Indicators: Intensive Care Unit Example”. Health Training and Research Hospital ethics committee approval was obtained with decision number 22/2015. This study was conducted in compliance with the Declaration of Helsinki and Good Clinical Practices guidelines.

6.2 Informed Consent

The participants were informed by their written consent about the research purpose and goals.

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