ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

The Turkish Adaptation, Validity and Reliability of Intensive Care Unit Mobility Scale: A Methodological Study

Yoğun Bakım Ünitesi Mobilizasyon Ölçeğinin Türkçeye Uyarlama, Geçerlik ve Güvenirlik Çalışması: Metadolojik Çalışma

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ABSTRACT Objective: The aim of this study was to adapt the Intensive Care Units (ICU)-Mobility Scale which evaluates and classifies the mobilization status of ICU patients into Turkish. **Material and Methods:** A methodological and cross-sectional study design was used. This study was conducted in different types of ICU (Anesthesia ICU, Internal Medicine ICU, Neurology ICU, Coronary ICU, Cardiovascular Surgery ICU, and Neurosurgery ICU) of an Education and Research Hospital in İstanbul between June and August 2019 with a hundred patients receiving treatment. Data were collected using a questionnaire developed by the researchers and the ICU-Mobility Scale. For the validity of the scale, the language validity was tested. In order to determine its reliability, kappa inter-observer compliance analysis was performed. **Results:** Patients hospitalized in medical (65%) and surgical (35%) ICUs were involved in the study. Of the patients, 51% were female and 49% were male. The average age of the patients is 69.65±16.33 years. The language validity of the scale was ensured with World Health Organization's methods for the translation and adaptation of instruments developed in different languages. As a result of the kappa observer agreement, 0.846 (p<0.001) was found to be high in reliability. The ICU-Mobility Scale was found to be valid and reliable in this study. **Conclusion:** Classification of types of mobilization is important in order to overcome barriers and standardize protocols that can be carried out. The ICU-Mobility Scale may be used to standardize and record the patients' mobility status in the ICU.

Keywords: Intensive care units; movement; mobility limitation

ÖZET Amaç: Bu çalışmanın amacı, yoğun bakım hastalarının mobilizasyon düzeylerini değerlendiren ve sınıflandıran Yoğun Bakım Ünitesi (YBÜ)-Mobilizasyon Ölçeğinin Türkçeye uyarlanmasıdır. **Gereç ve Yöntemler:** Bu çalışma, metadolojik ve kesitsel olarak yürütülmüştür. Çalışma, Haziran-Ağustos 2019 tarihleri arasında İstanbul'da bir Eğitim ve Araştırma Hastanesinin farklı YBÜ'lerinde (Anestezi ve Reanimasyon YBÜ, İç Hastalıkları YBÜ, Nöroloji YBÜ, Koroner YBÜ, Kalp Damar Cerrahisi YBÜ ve Beyin Cerrahi YBÜ) tedavi gören 100 hastayla gerçekleştirilmiştir. Veriler, araştırmacılar tarafından geliştirilen anket formu ve YBÜ-Mobilizasyon Ölçeği kullanılarak toplanmıştır. Ölçeğin geçerliliği için dil geçerliliği test edilmiştir. Güvenilirliğini belirlemek için kappa gözlemciler arası uyum analizi yapılmıştır. **Bulgular:** Dahili (%65) ve cerrahi (%35) YBÜ'lerinde yatan hastalar çalışmaya alınmıştır. Hastaların %51'i kadın, %49'u erkektir. Hastaların yaş ortalaması 69,65±16,33'tür. Ölçeğin dil geçerliliği, Dünya Sağlık Örgütünün farklı dillerde geliştirilen ölçeklerin çeviri ve uyumuna ilişkin önerdiği yöntemlerle sağlanmıştır. Kappa gözlemciler arası uyum katsayısı 0,846 (p<0,001) olarak güvenilirlik açısından yüksek bulunmuştur. YBÜ-Mobilizasyon Ölçeği'nin bu çalışmada geçerli ve güvenilir olduğu görülmüştür. **Sonuç:** Mobilizasyon düzeyinin sınıflandırılması; olası engellerin aşılması ve gerçekleştirilebilecek protokollerin standartlaştırılması için önemlidir. YBÜ-Mobilizasyon Ölçeği, hastaların YBÜ'lerdeki hareketlilik durumunun standardize edilmesi ve kaydedilmesi için kullanılabilir.

Anahtar Kelimeler: Yoğun bakım üniteleri; hareket; hareket kısıtlılığı

The need for intensive care support in medical and surgical patients increases due to the applicable complex surgical procedures to a wide variety of populations and the aging of the population and the increase in chronic diseases.[1] Therefore, the group of patients expected to benefit from intensive care is expanding, and actual intensive care beds are in the risk of not meeting this requirement.[2] In order to solve this problem, procedures improving patient outcomes and recovery that support the discharge of patients from intensive care units (ICUs) are suggested.[3]

ICUs provide support for organ failure during acute illness and require individuals to stay in bed for a certain period of time.[4-6] Immobility due to short or long-term bed rest causes many complications, especially cardiovascular, neuromuscular, respiratory, and skin problems. Early mobilization and physical rehabilitation are safe and feasible methods that reduce or prevent these complications, increase the recovery process, and thus significantly reduce the length of stay in ICU and mortality.[4-8]

Mobilization methods in ICUs are used with a multidisciplinary approach in treatment to improve respiratory and cardiovascular functions, prevent immobilization complications, and improve the psychological sense of well-being.[4, 9-11] "Early postoperative mobilization" is an important component in enhanced recovery after surgery protocols. It also encourages early mobilization of critically ill patients, even on mechanical ventilation and even intensive care patients undergoing radical surgery be mobilized within the first 24 hours, provided that their vital signs are stable.[12]

Mobilization methods in intensive care patients consist of active-passive range of motion exercises, position change, raising the head of the bed, turning in the bed, exercises in-bed, sitting in the bed or over edge of bed, transferring from the bed to the chair, standing and walking activities.[3,7,11] However, during the recording of mobilization applied in ICU, limited expressions such as "the patient was mobilized", "the patient was seated on the chair/bedside", and "the patient was standing up" are generally used. There is no measurement tool that classifies the mobilization levels of patients in ICU in a fast, easy and applicable manner and creates a common language for healthcare professionals. Therefore, the aim of this study is to adapt the ICU-Mobility Scale, which evaluates and classifies the mobilization status of patients in the ICU into Turkish.

MATERIAL AND METHODS

STUDY DESIGN AND SAMPLE

A methodological and descriptive study design was used. The sample included a hundred patients (n=100) because the scale had total 11 items. The sample size for each scale item should be 5-10 participants for validity and reliability studies.[13] Inclusion criteria for patients were treated in the ICU, over 18 years, and stayed in ICU for over 24 hours.

ETHICAL CONSIDERATIONS

Before starting the study, permission was obtained from the developer of the ICU-Mobility Scale. This study was approved by the Bilecik Şeyh Edebali University Ethics Committee (07.05.2019/3/1). The participating patients and family members were informed about the purpose of the study. Informed consent was obtained from all participants in the study. The study was performed in accordance with the Declaration of Helsinki.

DATA COLLECTION

Data were collected from patients in different types of ICUs (Anesthesia ICU, Internal Medicine ICU, Neurology ICU, Coronary ICU, Cardiovascular Surgery ICU, and Neurosurgery ICU) of an Training and Research Hospital in İstanbul between June and August 2019. The data were collected by a questionnaire developed by the researchers and the ICU-Mobility Scale. During data collection, all data of the patients were collected considering their current situation. Patients continued to stay in the ICU after data collection.

The Questionnaire: It consisted of questions about patients and ICUs regarding the age, gender, type of ICU, length of stay in ICU, mechanical ventilation support, presence of tracheostomy and inotropic drug support.

The Intensive Care Units-Mobility Scale: The ICU-Mobility Scale was developed by Hodgson et al.

to provide a structured method for collecting mobility data of patients in ICU, to help healthcare professionals working in ICU to monitor the recovery process of patients, and to help researchers to measure mobility levels of patients objectively.[14] The scale consists of 11 items with scoring, classification and description between 0 and 10 from nothing (lying/passive exercises in bed, score of 0) to independent ambulation (score of 10). The validity and responsiveness of the scale was studied by Tipping et al.[15] The last version of the scale was studied by Tipping et al.[16]

STATISTICAL ANALYSIS

Data were analyzed in SPSS-21 package program. For descriptive statistics, number, percentage, mean and standard deviation were calculated. In the adaptation process, language validity and kappa inter-rater agreement analysis was performed.

Since the ICU-Mobility Scale is not a Likert type scale and has no sub-dimensions, the construct validity could not be made. Since there is no Turkish scale that classifies mobilization situations in the ICU, equivalent form validity could not be made. Language validity was tested for the validity of the scale. During the creation of the original version of the scale, the scope was created as a grading of mobilization by a multidisciplinary team both in the study and in the congress they presented. Therefore, the scope was not validated.

Since the ICU-Mobility Scale is not a Likert-type scale but an observational scale, Cronbach's alpha coefficient could not be calculated in its internal validity. Kappa inter-rater agreement analysis was conducted to determine its reliability between two observers.

RESULTS

CHARACTERISTICS OF PARTICIPANTS

A total of 100 participants were included in the study, 51 (51%) female and 49 (49%) male. The average age of the patients was 69.65±16.33 years (range, 18-95). Of the patients, 65 (65%) were hospitalized in medical and 35 (35%) were in surgical ICU. The mean length of stay in ICU was 7.18±10.74 days at the time of data collection. In the study, forty (40%) patients were on mechanical ventilation support and the mean duration of mechanical ventilation days was determined as 9.90±12.17 days. Of the patients, seven (7%) had a tracheostomy and 25 (25%) used inotropic drug support (Table 1).

VALIDITY

For the validity of the scale, the language validity was tested. World Health Organization has suggested a method for the translation and adaptation of instruments developed in different languages.[17] Language validity of the ICU-Mobility Scale was made in line with these recommendations. Firstly, the scale was translated from English to Turkish and then it was translated back from Turkish to English by five experts. These experts had been living in Turkey and had a good command of English and Turkish to ensure the integrity of meaning. After the final Turkish language of the scale was created, it was administered to ten patients by five ICU nurses for pilot study. These patients were not included in the study.

RELIABILITY

Kappa inter-rater agreement analysis was performed to determine the reliability of the scale. Kappa coefficient is the statistic that measures the agreement between observers in the evaluation of categorical items.[18] In this study, the proposed Cohen's kappa measures was used to measure the agreement between two observers. While one of the observers was a standard researcher, the other was any nurse working in the ICUs where the data were collected and

TABLE 1: Characteristics of patients.			
Intensive care unit	Medical	n (%)	65 (65%)
	Surgical		35 (35%)
Mechanical ventilation support	Yes	n (%)	40 (40%)
	No		60 (60%)
Tracheostomy	Yes	n (%)	7 (7%)
	No		93 (93%)
Inotropic drug support	Yes	n (%)	25 (25%)
	No		75 (75%)
Days in ICU		Mean±SD	7.18±10.74
Days on mechanical ventilation		Mean±SD	9.90±12.17

ICU: Intensive care unit; SD: Standard deviation.

working overtime during data collection. The observer, who was a researcher, was recorded as "observer 1" and the other observers as "observer 2". Each patient was evaluated by a researcher and a nurse as observer 1 and observer 2. The evaluation was made at the same time, and the observers did not interact with the data collection. The result of the Cohen's kappa inter-rater agreement analysis was determined as 0.846 (p<0.001) (Table 2). This result shows that the reliability of the scale was high. The Turkish version of the scale is shown in Appendix.

DISCUSSION

This study was conducted to determine the validity and reliability of the ICU-Mobility Scale which was developed to evaluate the mobilization status of ICU patients. Early mobilization in ICU reduces the length of stay in ICU and hospital, and improves the functional mobility.[19-21] ICU nurses has positive attitudes to early mobilization but they have some misunderstandings, negativity, and barriers.[22] It has been reported in the literature that more patients were mobilized with the application of a protocol for early mobilization of ICU patients.[23,24] Classification of types of mobilization is important in order to overcome barriers and standardize protocols that can be carried out.

Steps have been proposed for language validity for translating and adapting instruments developed in different languages by the World Health Organization.[17] As a result of the steps made according to this method, it was decided that the scale was compatible with the original scale in terms of language validity.

ICU-Mobility is a scale in which the mobilization status of individuals is classified as a result of observation. Inter-rater agreement should be evaluated to examine psychometric properties in measurements obtained by directly observing individuals.[25] Kappa test

TABLE 2: Interobserver reliability results.

	Mean±SD	Kappa coefficient	p value
Observer 1	2.30±3.26	0.846	<0.001
Observer 2	2.26±3.25		

SD: Standard deviation.

APPENDIX

Sınıflama	Tanım
0 Hareket yok (yatakta uzanma)	Kendi kendine aktif olarak hareket etmeden sadece sağlık çalışanı tarafından döndürülme veya hareket ettirilme.
1. Yatakta oturma, yatak içinde hareket etme	Yatak dışına çıkmadan veya yatağın kenarı boyunca hareket etmeden yatak içinde çeşitli aktivitelerde (kıpırdama, dönme vb.) bulunma.
2. Pasif olarak sandalyeye alınma (ayağa kalkmadan)	Ayağa kalkmadan ya da yatağın kenarında oturmadan pasif olarak kaldırılarak, döndürülerek veya kaydırılarak sandalyeye alınma.
3. Yatak kenarında oturma	Kendi kontrolü ya da çalışanların yardımıyla aktif olarak yatağın kenarında oturma.
4. Ayakta durma	Yardımlı (masadan ya da bir cihazdan alınan destek gibi) ya da yardımsız olarak ayakta durma pozisyonunda olma/ayakta dikilme.
5. Yataktan sandalyeye geçme	Sandalyeye geçerken adım atabilme veya ayağını sürüyebilme. Bu durum, sandalyeye geçmek için aktif olarak ağırlığın bir bacaktan diğerine aktarılmasını gerektirir. Hasta bir cihaz yardımıyla ayağa kalktıysa sandalyeye doğru adım atmalıdır (hastanın ayağa kalkmasını sağlayan yardımcı bir cihazla sandalyeye taşınması bu duruma dâhil değildir).
6. Yerinde adımlama (yatak kenarında)	Yardımlı ya da yardımsız olarak ayaklarını kaldırarak yerinde adım atma (her 2 ayağını en az 2 kez kullanarak, toplam en az 4 kez adımlamak üzere).
7. İki ya da daha fazla kişinin yardımıyla yürüme	İki ya da daha fazla kişiden yardım alarak yatak veya sandalyeden en az 5 metre uzağa yürüme.
8. Bir kişinin yardımıyla yürüme	Bir kişiden yardım alarak yatak ya da sandalyeden en az 5 metre uzağa yürüme.
9. Yardımcı bir cihazla bağımsız yürüme	Başka bir kişiden yardım almadan yardımcı bir cihazla yataktan ya da sandalyeden en az 5 metre uzağa yürüme (tekerlekli sandalyeye bağımlı bir kişinin, sandalyeyi bağımsız olarak yataktan ya da sandalyeden 5 metre uzağa sürmesi de dâhildir).
10. Yardımcı cihaz olmadan bağımsız yürüme	Başka bir kişiden ya da yardımcı bir cihazdan yardım almadan yataktan ya da sandalyeden en az 5 metre uzağa yürüme.

is a statistical method that measures the reliability of agreement between two or more observers.[26] Kappa coefficient takes a value between "-1" and "+1". A kappa coefficient weight of "+1" indicates that there is a perfect agreement between the two observers, "-1" indicates that the mismatch between the two observers is perfect, and "0" indicates that the agreement between the two observers is entirely due to chance.[18] Kappa coefficient weights are classified as <0 "no match", between 0.00-0.20 "insignificant agreement", between 0.21-0.40 "low level of agreement", between 0.41-0.60 "moderate agreement", between 0.61-0.80 "significant agreement" and between 0.81-1.00 "nearly perfect agreement".[27,28] In the original scale, the kappa coefficient was measured between different observers and was determined as 0.77, 0.84 and 0.90.[14] In our study, the result of kappa coefficient was found as 0.846. This result was evaluated as "nearly perfect agreement" according to Landis and Koch.[28] The ICU-Mobility Scale has been evaluated as valid in its current form.

LIMITATIONS

The study was conducted at a single hospital in Turkey. Therefore, it cannot be generalized for other regions and cultures.

CONCLUSION

As a result of the validity and reliability analyses conducted in this study, it can be said that the Turkish version of the ICU-Mobility Scale is a valid and reliable tool that can be used to evaluate the level of mobility status of ICU patients. This measurement tool, which allows the mobilization status of patients to be recorded in a certain standard, can standardize patient records and be used in scientific researches.

Authorship Contributions

Idea/Concept: Özlem İbrahimoğlu, Hülya Saray Kılıç, Gizem Açıkgöz; Design: Özlem İbrahimoğlu, Hülya Saray Kılıç, Gizem Açıkgöz; Control/Supervision: Özlem İbrahimoğlu, Hülya Saray Kılıç; Data Collection and/or Processing: Özlem İbrahimoğlu, Gizem Açıkgöz; Analysis and/or Interpretation: Özlem İbrahimoğlu, Hülya Saray Kılıç; Literature Review: Özlem İbrahimoğlu, Hülya Saray Kılıç, Gizem Açıkgöz; Writing the Article: Özlem İbrahimoğlu, Hülya Saray Kılıç, Gizem Açıkgöz; Critical Review: Özlem İbrahimoğlu, Hülya Saray Kılıç, Gizem Açıkgöz; References and Fundings: Özlem İbrahimoğlu, Gizem Açıkgöz.

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