SAĞLIK BİLİMLERİ ÜNİVERSİTESİ HEMŞİRELİK DERGİSİ
University of Health Sciences Journal of Nursing
Cilt / *Volume* 7 • Sayı / *Number* 3 • Aralık / *December* • 2025

Araştırma makalesi / *Research article* • **DOI: 10.48071/sbuhemsirelik.1663516**

Cultural Adaptation and Psychometric Validation of the Turkish Version of the Blood Donation Barriers Scale in University Students

Üniversite Öğrencilerinde Kan Bağışı Engeller Ölçeğinin Türkçe Versiyonun Kültürel Adaptasyonu ve Psikometrik Geçerliliği

Betül BAYRAK[1], **Gülşah ÇAMCI**[2]

Yazarların ORCID numaraları / ORCID IDs of the authors:
B.B.: 0000-0003-4482-440X; G.Ç.: 0000-0002-1463-0674

[1]Süleyman Demirel University, Faculty of Health Sciences, Department of Nursing, Department of Internal Diseases Nursing, Isparta, Türkiye

[2]Marmara University, Faculty of Health Sciences, Department of Nursing, Department of Internal Medicine Nursing, Istanbul, Türkiye.

Sorumlu yazar / Corresponding author: Gülşah ÇAMCI
E-posta: gulsah.camci@marmara.edu.tr

Geliş tarihi / Date of receipt: 24.03.2025
Kabul tarihi / Date of acceptance: 22.07.2025

Atıf / Citation: Bayrak, B., & Çamcı, G. (2025) Cultural adaptation and psychometric validation of the Turkish version of the Blood Donation Barriers Scale in university students. *UHS Journal of Nursing, 7*(3), 213-220. doi: 10.48071/sbuhemsirelik.1663516

ABSTRACT

Introduction: Blood donation can save millions of lives. However, blood donation rates remain insufficient. Contributing factors may include fear of donating blood, lack of knowledge, and health-related issues.

Aim: This study was conducted as a methodological study to examine cultural adaptation and psychometric validation of the Turkish version of the Blood Donation Barriers Scale in university students.

Method: This study involved 255 students from the nursing and midwifery departments of a state university in Türkiye between February - March 2022.

Results: Of the participants, 72.9% were nursing students, 83% were second-year students, and 13.7% had not donated blood before. The results of the exploratory factor analysis (EFA) indicate that the scale is composed of four sub-dimensions and consists of 25 items. These sub-dimensions are classified as informative barriers, procedural barriers, intrinsic barriers, and time-space barriers. The goodness of fit values in confirmatory factor analysis were CMIN/DF(X^2/Sd) = 561.40/264 = 2.13, RMR = 0.02, GFI = 0.90; CFI = 0.91, RMSEA= 0.07. The Kuder Richardson-20 coefficient was 0.72 for the informative barriers, 0.81 for the intrinsic barriers, 0.71 for the time-space barriers, 0.64 for the procedural barriers, and 0.87 for the total scale found. In the Test-retest analysis, there was no significant difference between the means of the first and second measurements in the subdimensions of the scale.

Conclusion: The Turkish Blood Donation Barriers Scale is a valid and reliable tool with 25 items and 4 sub-dimensions. It can be easily applied to determine blood donation barriers in Türkiye.

Keywords: Blood donation; fear; psychometrics; students.

ÖZ

Giriş: Kan bağışı milyonlarca insanın hayatını kurtarabilir. Ancak, kan bağışı oranları yeterli değildir. Bunun nedenleri; kan verme korkusu, bilgi eksikliği ve sağlık sorunları olabilmektedir.

Amaç: Bu çalışma, üniversite öğrencilerinde kan bağışı engeller ölçeğinin Türkçe versiyonunun kültürel adaptasyon ve psikometrik geçerliliğini incelemek amacıyla metodolojik bir çalışma olarak planlandı.

Yöntem: Bu çalışma, 1 Şubat-30 Mart 2022 tarihleri arasında Türkiye'deki bir devlet üniversitesinin hemşirelik ve ebelik bölümünde öğrenim gören 255 öğrenci ile yapıldı.

Bulgular: Katılımcıların %72,9'u hemşirelik öğrencisi, %83'ü ikinci sınıf öğrencisi ve %13,7'sinin daha önce kan bağışında bulunmadığı saptandı. Açımlayıcı faktör analizi sonucuna göre ölçeğin dört alt boyut ve 25 maddeden oluştuğu belirlendi. Ölçeğin alt boyutları; bilgilendirici engeller, prosedürel engeller, içsel engeller ve zaman-mekan engelleridir. Doğrulayıcı faktör analizi sonucunda uyum iyiliği değerleri; CMIN/DF(X^2/Sd) = 561,40/264 = 2,13, RMR = 0,02, GFI = 0,90; CFI = 0,91, RMSEA = 0,07 olarak bulundu. Kuder Richardson-20 katsayısı bilgilendirici engeller için 0,72, içsel engeller için 0,81, zaman-mekan engelleri için 0,71, prosedürel engeller için 0,64 ve toplam ölçek için 0,87 olarak bulundu. Test-tekrar test analizinde ölçeğin alt boyutlarında birinci ve ikinci ölçümlerin ortalamaları arasında anlamlı bir fark saptanmadı.

Sonuç: Türkçe kan bağışı engeller ölçeği, 25 madde ve 4 alt boyutuyla geçerli ve güvenilir bir araçtır. Türkiye'de kan bağışı engelerini belirlemek için kolayça uygulanabilir.

Anahtar Kelimeler: Kan bağışı; korku; psikometrik; öğrenciler.

Introduction

A blood transfusion center that provides access to adequate amounts of safe blood and blood products is essential to an effective healthcare system (WHO, 2023). Donating blood saves millions of lives and improves many patients' health and quality of life (Zago, Silveira, & Dumith, 2010). The need for blood is universal, but access to blood is not easy for everyone who needs it. Blood shortages are especially common in developing countries. Blood donation rates are insufficient (WHO, 2023).

In recent years, the blood donor pool has been decreasing due to the imbalance between blood supply and demand (Gammon et al., 2023). The reason for this is the increase in medical and surgical interventions, the aging population, stricter donor selection criteria, the perishable nature of blood, and the decrease in donations. Since artificial blood is not currently in use, stability depends on voluntary donors (Shrivastava, Meshram, & Inkane, 2025).

Each year, approximately 118.5 million blood donations are collected worldwide. High-income countries, which represent only 16% of the global population, account for 40% of these donations. They also report the highest blood donation rate, with 31.5 donations per 1,000 people. In these countries, blood transfusions are most commonly administered to individuals aged 60 years and older, comprising 75% of all transfusions (WHO, 2023).

In contrast, low-income countries contribute a significantly smaller proportion of blood donations and report the lowest donation rate, with only 5.0 donations per 1000 people. Despite this limited supply, 54% of all transfusions in low-income countries are given to children under the age of five. Blood donation rates also vary across middle-income countries: upper-middle-income countries report a rate of 16.4 per 1000 people, while lower-middle-income countries show a rate of 6.6 per 1000 people (WHO, 2023).

In order to retain blood donors, transfusion centers must identify the factors that encourage and hinder donation (Rodrigues & Carlos, 2021). Donation barriers and motivations should be taken into consideration. Barriers can be defined as any factors that prevent or hinder individuals from donating, such as fear of needles, lack of time, or health issues (Reid, Miller, & West-Mitchell, 2025; Saeed, Naeemi, Hakim, & Arian, 2025). Motivation, on the other hand, refers to any force or source that drives individuals to donate, such as prosocial reasons, positive emotions, or incentives. The relationship between barriers and motivations is significant. When the number of perceived barriers exceeds the level of motivation, individuals are likely to decide against donating; conversely, when motivation outweighs barriers, they are more inclined to donate (Irineu & Cassemiro, 2025).

Barriers to blood donation include fear, inconvenient donation sites, lack of time, physical reactions, lack of knowledge, limited operating hours of donation centers, and the location of donation sites (Irineu & Cassemiro, 2025; Mohammed & Essel, 2018; Romero-Domínguez, Martín-Santana, Sánchez-Medina, & Beerli-Palacio, 2022). However, human behavior is inherently heterogeneous. Therefore, donation barriers may also be influenced by other factors such as an individual's sociodemographic characteristics and donation-related behaviors. For example, negative donation experiences, the sight of blood, feeling unwell, failure to meet medical eligibility criteria, and the fact that women tend to experience greater fear of blood donation compared to men are all relevant considerations (Romero-Domínguez et al., 2022).

A study conducted in Southern Brazil found that the prevalence of blood donation was 32%. The prevalence of blood donation was higher in men, those with high economic status, and those with high self-perceptions (Zago et al., 2010).

Research conducted in Jordan identified peer influence, media exposure, and religious beliefs as significant determinants of individuals' awareness and perceptions regarding blood donation. Furthermore, the study highlighted that the country's existing educational initiatives on blood donation are insufficient in effectively fostering awareness and encouraging participation (Abderrahman & Saleh, 2014). A study conducted in the Kingdom of Saudi Arabia revealed that university students possess limited knowledge regarding blood donation. Additionally, the overall prevalence of blood donation among students was low. The primary barriers preventing blood donation included perceived ineligibility, concerns about contracting infectious diseases, and a preference to reserve donations for a close friend in the future (Mahfouz et al., 2021). In some studies, the bad attitude of the staff, the worry about selling the donated blood, weakness, and fear were seen as barriers to donating blood (Alaskar et al., 2021; Gomes, Nogueira, Antão, & Teixeira, 2019; Ibrahim, Koç, & Abdallah, 2021; Ramondt, Zijlstra, Kerkhof, & Merz, 2020).

University students are a potential group for blood donation because they are young and healthy. Identifying the barriers that affect blood donation among students is important for promoting blood donation (Irineu & Cassemiro, 2025).

Aim

This study was conducted to determine cultural adaptation and psychometric validation of the Turkish version of the Blood Donation Barriers Scale in university students.

Research Questions

1. Is the Turkish version of the Blood Donation Barriers Scale a valid instrument?

2. Is the Turkish version of the Blood Donation Barriers Scale a reliable instrument?

Method

Study Design

This study is methodological research designed to assess the validity and reliability of the instrument.

Study Population and Sample

The study's population included all students at the Midwifery and Nursing Department of the Faculty of Health Sciences of a university in Istanbul, Türkiye, between January - March 2022. For conducting factor analysis within validity and reliability assessments, the sample size should be at least five to ten times the total number

of items in the scale. This criterion ensures the robustness of the factor structure and enhances the generalizability of the findings (Esin, 2021; Karakoç & Dönmez, 2014). The study intended to reach at least 250 students because the scale had 25 items. In the study, students were selected using a convenience sampling method. Only those who agreed to participate during the data collection process were included. There were 255 students in the study.

Inclusion Criteria for the Study: University students who agreed to participate in the research and approved the informed consent form, over 18 years old, no communication problems.

Exclusion Criteria from Exclusion Criteria from Study: University students voluntarily withdrew during the study period. University students who filled out the surveys incompletely (n=0)

Data Collection Tools and Process

The Student Information Form and the Turkish version of the Blood Donation Barriers Scale were used. Data were collected face-to-face. The questionnaire was distributed before or after the lesson. The researchers remained available during the administration of the questionnaires to answer any potential questions or clarify items when necessary. On average, it took 10–15 minutes for participants to complete the questionnaire.

Student Information Form: The literature on the subject was examined and prepared by the researchers (Abderrahman & Saleh, 2014; Mahfouz et al., 2021; Naz Saud, Amjad, Kamal, Shahid, & Nizam, 2020; Romero-Domínguez et al., 2022; Zucoloto et al., 2019). The form consists of 13 questions about sociodemographic characteristics (age, gender, marital status, etc.) and blood donation (have you ever donated blood, blood group, etc.).

Blood Donation Barriers Scale: The Blood Donation Barriers Scale was developed by Romero-Domínguez et al. (2021) and has 25 items and 4 sub-dimensions. The identified sub-dimensions include informative barriers, procedural barriers, intrinsic barriers, and time-space barriers. Informative barriers pertain to a lack of awareness regarding the blood donation process, the locations and operating hours of donation centers, and the continuous demand for blood. Intrinsic barriers encompass personal factors such as individual beliefs, perceptions, and psychological concerns that hinder donation. Time-space barriers refer to challenges related to inconvenient donation conditions, including unsuitable timing and location constraints. Finally, procedural barriers are barriers that can discourage repeat donations. Each item is answered yes or no. Yes = one point, no = zero points. A score of 0–5 is obtained from informative barriers, 0–11 from intrinsic barriers, 0–5 from time-space barriers, and 0–4 from procedural barriers. A higher score indicates a greater perceived level of barriers (Romero-Domínguez et al., 2022).

Ethical Consideration

The participants gave both written and verbal informed consent prior to their inclusion in the study. Additionally, formal authorization was granted by the original developer of the Blood Donation Barriers Scale for its application in this research. All collected data were anonymized. Completed surveys were stored in a locked cabinet accessible only to the research team. Additionally, digital data was securely stored on a password-protected computer. Ethical approval was obtained from the Ethics Committee of the Süleyman Demirel University Health Sciences (Date: 10.11.2021 and No: 53-14). Institutional approval for the study was obtained from the Dean of the Faculty of Health Sciences at the university.

Data Analysis

The SPSS (Statistical Package for Social Sciences) package program and the trial version of the AMOS 24 program were used in the analysis of the research data. The Shapiro-Wilk test assessed whether the variables followed a normal distribution. Additionally, descriptive statistical methods**,** including standard deviation, mean, percentage**,** and frequency, were employed to summarize and interpret the findings.

The Blood Donation Barriers Scale was translated by two language experts from English to Turkish. Two lecturers compared the translation, and a draft inventory was obtained. Five experts evaluated the draft inventory, and scale items were revised with their feedback. The pilot study comprised ten students. After that, two different linguists retranslated the draft inventory from English to Turkish. The study used the end image of the scale. The validity analysis of the study used the Kaiser-Meyer-Olkin test, Bartlett's sphericity, confirmatory factor analysis, and exploration factor analysis. The Kuder Richardson-20 coefficient, test-retest, and Pearson correlation were used in reliability analysis (Esin, 2021).

Results

Sociodemographic Characteristics

For the validity and reliability assessment of the scale, a minimum of 250 students was targeted, aligning with the recommendation that the sample size should be at least ten times the number of scale items. As no modifications were made to the scale items, the final analysis included data from all 255 participating students. According to these results, the average age of the students participating in the study was 20.07 ± 1.61, and 84.3% were women. 72.9% of the students were enrolled in the nursing department, and 83.1% were in their second year of study. A total of 87.5% reported not smoking. Among the students, 33.3% had blood type A Rh (+), 13.7% had previously donated blood, and 9.8% had donated blood 1–3 times (Table 1).

Validity

Content Validity

After two bilingual experts translated the scale items, they were submitted for content validity assessment. Five subject-matter experts were asked to evaluate each item's clarity and relevance to the construct. The evaluation was conducted using a four-point scale: 1 = not suitable, 2 = somewhat appropriate, 3 = highly appropriate, and 4 = very appropriate. The ratings were analyzed using the Davis technique. Since the Content Validity Index (CVI) for each item was ≥ .80, no items were excluded from the scale.

Construct Validity

Exploratory Factor Analysis: Exploratory Factor Analysis (EFA) was performed to determine whether the Turkish version of

Table 1: Students' Descriptive Characteristics (n = 255)

Characteristics	Mean ± SD	
Age	20.07 ± 1.609	
	n	**%**
Gender		
Female	215	84.3
Male	40	15.7
Department		
Nursing	186	72.9
Midwifery	69	27.1
Marital Status		
Married	2	0.8
Single	253	99.2
Grade		
First class	17	6.7
Second class	212	83.1
Third class	13	5.1
Fourth class	13	5.1
Smoking Status		
Yes	22	8.6
No	223	87.5
Left	10	3.9
Blood Group		
A Rh (+)	85	33.3
A Rh (-)	12	4.7
B Rh (+)	29	11.4
B Rh (-)	4	1.6
AB(+)	25	9.8
0 Rh (+)	70	27.5
0 Rh (-)	11	4.2
Do not know	19	7.5
Perceiving Health Status		
Bad	2	0.8
Moderate	78	30.6
Well	140	54.9
Much well	35	13.7
Donating Blood Status		
Yes	35	13.7
No	220	86.3
Number of Blood Donation		
Never	220	86.3
1-3 times	25	9.8
4-6 times	6	2.34
7 and over times	4	1.56

SD: Standart Deviation

Table 2: Factor Loadings of Sub-Dimensions of Blood Donation Barriers Scale

Barrier dimensions	Factor1	Factor2	Factor3	Factor4
Informative barriers				
Item1	**0.78**	0.12	0.15	0.13
Item 2	**0.70**	0.35	0.13	-0.05
Item 3	**0.56**	0.34	0.13	-0.01
Item 23	**0.74**	0.29	0.09	0.21
Item 25	**0.69**	0.10	0.12	0.18
Intrinsic barriers				
Item 4	0.11	**0.40**	0.28	0.05
Item 5	0.08	**0.46**	-0.24	0.41
Item 6	0.20	**0.49**	0.29	0.13
Item 7	0.23	**0.37**	0.35	0.23
Item 16	0.08	**0.63**	-0.07	0.08
Item 17	-0.02	**0.68**	0.14	0.14
Item 18	0.08	**0.75**	0.10	0.06
Item 19	-0.04	**0.82**	0.16	-0.03
Item 20	-0.01	**0.68**	-0.08	0.05
Item 21	0.22	**0.42**	0.00	0.13
Item 22	0.27	**0.41**	0.06	0.38
Time–space barriers				
Item 8	0.26	-0.13	**0.58**	-0.03
Item 9	0.21	-0.08	**0.62**	0.24
Item 10	0.10	0.05	**0.67**	0.04
Item 11	0.20	0.27	**0.61**	0.15
Item 12	-0.14	0.08	**0.51**	0.33
Procedural barriers				
Item 13	-0.13	0.16	0.33	**0.63**
Item 14	0.17	0.26	0.19	**0.50**
Item 15	-0.12	0.22	0.22	**0.53**
Item 24	0.10	0.11	0.31	**0.75**
Eigenvalue	1.67	6.3	2.67	1.24
Partial explained variance (%)	9.19	15.64	13.63	9.18
Total explained variance (%)	47.64			
KMO	0.84			
Approx. Chi-Square	2021.73			
Df	300			
Sig.	**0.000**			

KMO: Kaiser-Meyer-Olkin; Df: Degrees of Freedom; Sig.: Significance

the Barriers to Blood Donation Scale had sub-dimensions and which sub-dimension the items represented. According to the EFA findings, the Kaiser-Meyer-Olkin (KMO) coefficient was 0.84, and the Barlett test result was $x^2 = 2021.73$. The scale consisted of four sub-dimensions, as in the original scale, and four sub-dimensions explained a total of 47.64% of the scale. The Varimax rotation method determined which of these four sub-dimensions the items represented. Accordingly, items 1, 2, 3, 23, and 25 are in the informative barriers sub-dimension; items 4, 5, 6, 7, 18, 19, 20, 21, and 22 are in the internal barriers subscale; items 8, 9, 10, 11, and 12 are in the time-space barriers sub-dimension; and items 13, 14, 15, and 24 are included in the procedural barriers sub-dimension. In addition, the loadings of the items in the informative barriers sub-dimension were between 0.56 and 0.78, in the intrinsic barriers sub-dimension between 0.37 and 0.82, in the time-space barriers sub-dimension between 0.51 and 0.67, and in the procedural barriers sub-dimension between 0.50 and 0.75 (Table 2).

Table 3: Goodness-of-fit Index Results

	Perfect fit criterion	Acceptable fit criterion	Postmodification
x^2/df	0 < x2/df < 3	3 < x2/df < 5	2.13
RMR	0.05 < RMR	0.08 < RMR	0.02
GFI	GFI > 0.95	GFI > 0.90	0.90
CFI	CFI > 0.95	CFI > 0.90	0.91
RMSEA	0.00 < RMSEA < 0.05	0.05 < RMSEA < 0.08	0.07

x^2/sd: Chi-square / Degrees of Freedom; RMR:Root Mean Square Residual; GFI:Goodness of Fit Index; CFI:Comparative Fit Index; RMSEA:Root Mean Square Error of Approximation

Confirmatory Factor Analysis: The first-level Confirmatory Factor Analysis (CFA) of the Blood Donation Barriers Scale, which comprises four sub-dimensions and a total of 25 items, as identified through EFA, is presented in Figure 1. The factor loadings of the items ranged from 0.38 to 0.67, indicating moderate to acceptable relationships between the observed variables and their respective latent constructs. The model fit indices were as follows: CMIN/DF (x^2/df) = 561.40/264 = 2.13, RMR = 0.02, GFI = 0.90, CFI = 0.91, and RMSEA = 0.07 (Table 3).

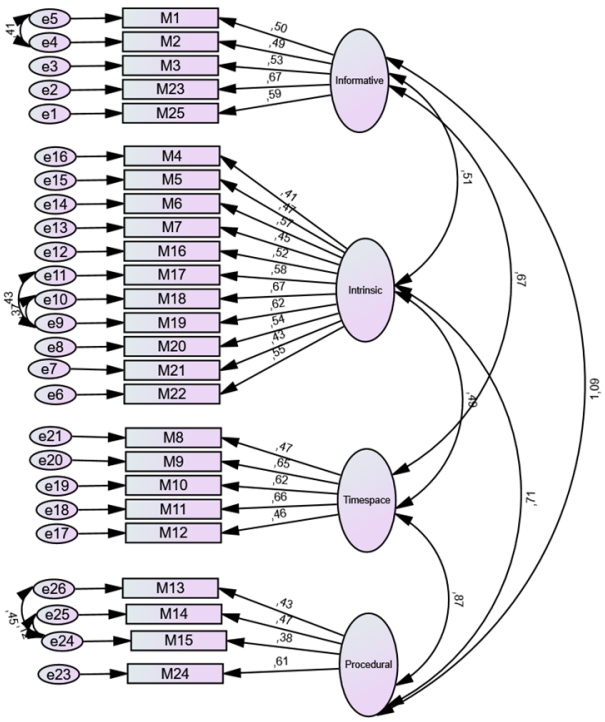

Figure 1: **Confirmatory Factor Analysis Path Diagram**

Reliability

According to the results of the reliability test analysis conducted to evaluate the internal consistency of the scale, the Kuder Richardson-20 (KR-20) coefficient was 0.72 for the informative barriers sub-dimension, 0.81 for the intrinsic barriers sub-dimension, 0.71 for the time-space barriers sub-dimension, 0.64 for the procedural barriers sub-dimension, and 0.87 for the whole scale (Table 4).

The average of the scale items was 1.48–1.88. The item-total correlation of the information barriers sub-dimension was 0.43–0.52, and when an item was deleted, the KR-20 coefficient was 0.65–0.69. The item-total correlation of the intrinsic barriers sub-dimension was 0.36–0.65, and when an item was deleted, the KR-20 coefficient was 0.77–0.81. The item-total correlation of the time-space barriers sub-dimension was 0.38–0.54, and when an item was deleted, the KR-20 coefficient was 0.63–0.69. The item-total correlation of the procedural barriers sub-dimension was 0.27–0.49, and when an item was deleted, the KR-20 coefficient was 0.51–0.67 (Table 5).

A test-retest analysis showed the invariance of the scale over time. The Blood Donation Barrier Scale was reapplied to 50 students with an interval of 15 days. There was no significant difference between the means of the first and second measurements in the sub-dimensions of the scale (p > 0.05). A positive, strong, and significant correlation was found in the correlation of the sub-dimensions of the scale (p < 0.001) (Table 4).

Table 4: Findings of The Scale's Kuder Richardson-20 Reliability Coefficient and Test–Retest Scores

Barrier dimensions	KR-20	Mean	SD	Min-Max		
Informative barriers	0.72	1.57	0.33	0-5		
Intrinsic barriers	0.81	1.73	0.25	0-11		
Time–space barriers	0.71	1.72	0.29	0-5		
Procedural barriers	0.64	1.70	0.32	0-5		
Global KR-20	0.87	6.73	0.93	4-8		
Comparison of test–retest scores (n = 50)						
Subscale	**First Measurement**	**Second Measurement**	**r†**	**p**	**t‡**	**p**
Informative barriers	2.40 ± 1.73	2.34 ± 1.69	0.98	**< 0.001***	1.35	0.182
Intrinsic barriers	2.82 ± 2.46	2.76 ± 2.36	0.99	**< 0.001***	1.35	0.182
Time–space barriers	1.66 ± 1.50	1.58 ± 1.44	0.97	**< 0.001***	1.66	0.103
Procedural barriers	1.18 ± 1.18	1.10 ± 1.11	0.97	**< 0.001***	2.06	0.051

SD: Standard Deviation; †r: Pearson Correlation Coefficent; ‡t: Paired Samples Test; *** p < 0.001**

Table 5: Analysis Results of the Items of the Blood Donation Barrier Scale

Factor	Item	Mean	Std. Deviation	Scale Mean if Item Deleted	Corrected Item-Total Correlation	KR 20 if Item Deleted
Informative barriers	M1	1.48	0.50	6.38	0.52	0.66
	M2	1.46	0.50	6.40	0.52	0.66
	M3	1.54	0.50	6.33	0.48	0.67
	M23	1.70	0.46	6.16	0.45	0.69
	M25	1.68	0.47	6.18	0.44	0.69
Intrinsic barriers	M4	1.86	0.35	17.22	0.36	0.81
	M5	1.88	0.33	17.20	0.40	0.81
	M6	1.71	0.46	17.37	0.48	0.80
	M7	1.69	0.47	17.39	0.34	0.81
	M16	1.54	0.50	17.54	0.48	0.80
	M17	1.69	0.47	17.39	0.57	0.79
	M18	1.66	0.48	17.42	0.64	0.78
	M19	1.69	0.46	17.39	0.65	0.78
	M20	1.89	0.32	17.19	0.51	0.80
	M21	1.61	0.49	17.47	0.39	0.81
	M22	1.87	0.34	17.21	0.45	0.80
Time space barriers	M8	1.70	0.46	6.91	0.42	0.68
	M9	1.54	0.50	7.07	0.55	0.62
	M10	1.68	0.47	6.94	0.52	0.63
	M11	1.82	0.39	6.80	0.46	0.66
	M12	1.87	0.33	6.74	0.39	0.69
Procedural barriers	M13	1.67	0.47	5.15	0.48	0.53
	M14	1.76	0.43	5.05	0.45	0.55
	M15	1.73	0.45	5.09	0.49	0.51
	M24	1.66	0.48	5.15	0.27	0.67

KR 20: Kuder Richardson 20

Discussion

In this study, we aimed to examine the validity and reliability of the blood donation barriers scale developed by Romero-Domínguez et al. in Türkiye. First of all, Romero-Domíngue et al. We have developed the Turkish version of the 25-item Barriers to Blood Donation Scale, of double likert type, developed by (2021) in English and used on the Spanish people to determine the barriers to blood donation. The item and scale consistency of the Turkish version of the scale was determined to be suitable for Turkish culture by getting full points according to the opinions of five experts. According to the results of the exploratory factor analysis, the Turkish Blood Donation Barriers Scale consisted of four sub-dimensions, as in the original scale. Items representing sub-dimensions were also the same as the original scale. The Turkish Blood Donation Barriers Scale sub-dimensions explained 47.64% of the scale (Table 2). At least 40% of the scale should be explained by the sub-dimensions (Gürbüz & Şahin, 2017). According to this information, four sub-dimension scales explain a sufficient level of variance. In addition, it was observed that the loads of the items constituting the sub-dimensions of the scale were above 0.30. This shows that the items adequately represent each sub-dimension (Çelik & Yılmaz, 2016).

The fit indices (goodness of fit) determine how well the model explains the data. The values of the goodness of fit index of the confirmatory factor analysis for the Turkish version of the Blood Donation Barriers Scale were CMIN/DF(x^2/Sd) = 561.40/264 = 2.13, RMR = 0.02, GFI = 0.90, CFI = 0.91, RMSEA = 0.07 (Figure 1). x^2/df value < 3 is good, 3 < x^2/df < 5 value is acceptable. Since the x2 value is affected by sample size, the ratio of degrees of freedom gives more reliable results. RMR < 0.05 is good, and RMR < 0.08 is acceptable. The population's invariance matrix tests the residual invariance between the sample's invariance matrix. GFI is considered excellent when it exceeds 0.95, while values above 0.90 indicate an acceptable fit. This index evaluates how well the model fits the data, independent of sample size. Similarly, CFI reflects a good model fit when greater than 0.95**,** with values above 0.90 considered acceptable. The CFI assesses the tested model by comparing it to a baseline model, accounting for degrees of freedom and sample size. RMSEA indicates a strong fit when below 0.05**,** whereas values under 0.08 are deemed acceptable. This metric evaluates how closely the model aligns with the observed variance while considering degrees of freedom (Steenkamp & Maydeu-Olivares, 2023; Sureshchandar, 2023).

In order to determine the internal consistency of the scale, KR-20 values were tested in the reliability analysis, as it was done when developing the original scale. KR-20 values are expected to be above 0.7 or close to 0.7 (Nunnally & Bernstein, 1994). According to this information, the scale's KR-20 value of 0.87 is acceptable. In addition, it is close to 0.7 in the procedural sub-dimension and above 0.7 in other sub-dimensions (Table 4). According to these results of the validity and reliability analysis, the Turkish Blood Donation Barriers Scale is suitable for use in Türkiye.

The invariance of the measurement instrument is assessed by test-retest analysis. Consistent results with repeated use indicate the performance of a measurement instrument (Esin, 2021; Gürbüz & Şahin, 2017). In this study, no significant difference was found between the sub-dimensions of the scale when measured two weeks apart ($p > 0.05$). There was a strong and positive correlation between the sub-dimensions of the scale (Table 4). Therefore, the Turkish Blood Donation Barriers Scale provided reliable results over time.

Limitations of the Study

The study can be conducted in a larger sample group. Nursing and midwifery students were included in this study. It is assumed that these students are more aware of the issue of blood donation than students in other disciplines not related to healthcare, which is a limitation of the study.

Conclusion

The Turkish blood donation barriers scale is a valid and reliable tool with 25 items and 4 sub-dimensions. It can be easily applied to determine blood donation barriers in Türkiye. This scale provides healthcare professionals and researchers with a practical instrument for identifying key obstacles that hinder voluntary blood donation. By systematically addressing these barriers, targeted interventions can be developed to increase donor participation, enhance public health outcomes, and ensure a more stable and adequate blood supply. The findings of this study contribute significantly to the literature on transfusion medicine and offer valuable guidance for designing culturally appropriate strategies to promote blood donation behavior. Future research involving more diverse populations and longitudinal designs is recommended to further validate and refine the scale.

Ethical Considerations: Ethical approval for the study was obtained from the Ethics Committee of the Süleyman Demirel University Health Sciences (Date 10.11.2021 and No: 53-14).

Author Contribution: Study Idea (Concept) and Design –GÇ, BB; Data Collection / Literature Review – GÇ, BB; Analysis and Interpretation of Data – GÇ, BB; Preparation of the Article– GÇ, BB; Approval of the Final Version to be Published– GÇ, BB.

Peer Review: External independent.

Conflict of Interest: The author report no conflicts of interest.

Sources of Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not for profit sectors.

References

Abderrahman, B. H., & Saleh, M. Y. (2014). Investigating knowledge and attitudes of blood donors and barriers concerning blood donation in Jordan. *Procedia-social and Behavioral Sciences, 116*, 2146-2154. doi:10.1016/j.sbspro.2014.01.535

Alaskar, S. A., Alsadhan, J. A., Alanazi, R. M., Alnashi, L. S., Almutairi, R. K., Chachar, Y. S., & Damlaj, M. (2021). Voluntary blood donation among female health care university students in Saudi Arabia: knowledge and status. *Journal of Family Medicine and Primary Care, 10*(6), 2353. doi:10.4103/jfmpc.jfmpc_2182_20

Çelik, H. E., & Yılmaz, V. (2016). *LISREL 9.1 ile yapısal eşitlik modellemesi: Temel kavramlar-uygulamalar-programlama*. (pp. 90-110).Ankara: Anı Yayıncılık.

Esin, N. M. (2021). Veri toplama araçlarının güvenirlik ve geçirliliği. In S. Erdoğan, N. Nahcivan, & N. M. Esin (Eds.), *Hemşirelikte Araştırma Süreç, Uygulama ve kritik* (pp. 216-225). İstanbul:Nobel tıp kitabevi.

Gammon, R. R., Rounak, D., K., G. G., Colleen, H., Aikaj, J., Singh, L. D., Sadhana, M., Amita, R. N., Shaughn, N., & Bocquet, C. (2023). Patient blood management and its role in supporting blood supply. *Journal of Blood Medicine, 14*, 595-611. doi:10.2147/JBM.S387322

Gomes, M. J., Nogueira, A. J., Antão, C., & Teixeira, C. (2019). Motivations and attitudes towards the act of blood donation among undergraduate health science students. *Transfusion and Apheresis Science, 58*(2), 147-151. doi:10.1016/j.transci.2018.12.018

Gürbüz, S., & Şahin, F. (2017). *Sosyal bilimlerde araştırma yöntemleri felsefe yöntem analiz* (4 ed.). (pp. 110-150). Ankara: Seçkin yayıncılık.

Ibrahim, A. A., Koç, M., & Abdallah, A. M. (2021). Knowledge level, motivators, and barriers of blood donation among students at Qatar University. *Healthcare, 9*(8), 926. doi:10.3390/healthcare9080926

Irineu, V. M., & Cassemiro, E. R. (2025). Motivators and barriers to blood donation among university students: An integrative review protocol. *Research, Society and Development, 14*(2), e11114248297-e11114248297. doi:10.33448/rsd-v14i2.48297

Karakoç, A. G. D. F. Y., & Dönmez, L. (2014). Ölçek geliştirme çalışmalarında temel ilkeler. *Tıp Eğitimi Dünyası, 13*(40), 39-49.

Mahfouz, M. S., Ryani, M., Hamzi, N. A. S., Zaeri, D. A., Dahdoh, A. A., Almalki, A. J., Hakami, J. A. A., ... Tawashi, I. H. (2021). Blood donation among university students: practices, motivations, and barriers in Saudi Arabia. *Avicenna Journal of Medicine, 11*(2), 70. doi:10.4103/ajm.ajm_113_20

Mohammed, S., & Essel, H. B. (2018). Motivational factors for blood donation, potential barriers, and knowledge about blood donation in first-time and repeat blood donors. *BMC Hematology, 18*(1), 36. doi:10.1186/s12878-018-0130-3

Naz Saud, A. G. R., Amjad, N., Kamal, A., Shahid, N., & Nizam, M. (2020). Factors affecting the motivation towards blood donation among university students in Lahore, Pakistan. *Age, 18*(21), 45.53.

Nunnally, J., & Bernstein, I. H. (1994). *Psychometric Theory* (3 ed.). McGraw Tepesi, Inc.

Ramondt, S., Zijlstra, M., Kerkhof, P., & Merz, E. M. (2020). Barriers to blood donation on social media: An analysis of Facebook and Twitter posts. *Transfusion, 60*(10), 2294-2306. doi:10.1111/trf.15998

Reid, L. N., Miller, M. J., & West-Mitchell, K. A. (2025). Blood donation practices, motivators and barriers in the Caribbean: A narrative review. *Transfusion Medicine, 35*(1), 33-40. doi:10.1111/tme.13107

Rodrigues, R. G., & Carlos, V. S. (2021). Attracting potential blood donors: The role of personality and social marketing. *Journal of Philanthropy and Marketing, 26*(3), e1694. doi:10.1002/nvsm.1694

Romero-Domínguez, L., Martín-Santana, J. D., Sánchez-Medina, A. J., & Beerli-Palacio, A. (2022). Blood donation barriers: How does donor profile affect them? *International Review on Public and Nonprofit Marketing*, 1-18. doi:10.1007/s12208-021-00303-5

Saeed, K. M. I., Naeemi, S., Hakim, M. S., & Arian, A. K. (2025). Factors influencing blood donation. *Journal of Hematology and Allied Sciences, 4*. doi:10.25259/JHAS_49_2024

Shrivastava, S. R., Meshram, P., & Inkane, S. (2025). Promoting inclusivity in blood donation: Public health. *National Journal of Community Medicine, 16*(02), 218-221. doi:10.55489/njcm.160220254884

Steenkamp, J.-B. E., & Maydeu-Olivares, A. (2023). Unrestricted factor analysis: a powerful alternative to confirmatory factor analysis. *Journal of the Academy of Marketing Science, 51*(1), 86-113. doi:10.1007/s11747-022-00888-1

Sureshchandar, G. (2023). Quality 4.0–a measurement model using the confirmatory factor analysis (CFA) approach. *International Journal of Quality & Reliability Management, 40*(1), 280-303. doi:10.1108/IJQRM-06-2021-0172

WHO. (2023). *Blood safety and availability.* Retrieved from (22.08.2023). https://www.who.int/news-room/fact-sheets/detail/blood-safety-and-availability.

Zago, A., Silveira, M. F. d., & Dumith, S. C. (2010). Blood donation prevalence and associated factors in Pelotas, Southern Brazil. *Revista de Saúde Pública, 44*, 112-120.

Zucoloto, M. L., Gonçalez, T., Menezes, N. P., McFarland, W., Custer, B., & Martinez, E. Z. (2019). Fear of blood, injections, and fainting as barriers to blood donation in Brazil. *Vox sanguinis, 114*(1), 38-46. doi:10.1111/vox.12728