Development of a Reliable and Valid Organ Tissue Donation and Transplantation Knowledge Scale

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ABSTRACT

Introduction. Knowledge has an important role in an individual’s willingness to donate organs upon death. Knowledge enables clarification of false beliefs, which can increase willingness to consent to organ donation. The purpose of the study was to describe and examine the validity and reliability of the Organ-Tissue Donation and Transplantation Knowledge Scale (ODTKS).

Methods. We performed a comprehensive literature review and chose 23 items for the scale according to specialists’ recommendations. A total of 6 items were excluded from the scale. Finally, the scale consisted of 17 items and 2 subdimensions.

Results. The study group consisted of 540 (267 [49.4%] male and 273 [50.6%] female) nonmedical staff members; 23.5% were primary school graduates, 47.6% were high school graduates, and 28.9% had university degrees or higher. The difficulty index and discrimination index of the overall scale were 22.41% to 54.07% and 0.23 to 0.46, respectively. Cronbach α coefficient was 0.88 overall. Retest reliability scores were significant (r = 0.87, P < .001).

Conclusions. The total score of the ODTKS was significantly higher among university graduates compared with primary school graduates and among people willing to donate. The ODTKS therefore has adequate reliability and validity for evaluating Turkish adults’ knowledge about organ tissue donation and transplantation.

Organ tissue transplantation is a treatment option that may bring hope for patients by providing disease-free living, increased quality of life, and increased recovery rates. Also, organ transplantation is a lifesaving treatment that can be used for a variety of conditions, including acute organ failure or chronic organ failure [1,2]. Organ transplantations are performed in over 100 countries, and approximately 117,700 were performed in 2013 [3]. One criterion of success of organ transplantation is determined by the number of deceased donors per million population (pmp). According to the International Registry in Organ Donation and Transplantation 2013 data, this ratio was 25.9 ppm in the United States and 35.1, 35.0, and 34.0 ppm in the 3 most successful European countries (Spain, Croatia, Malta), respectively [4]. The Turkish donation rate was 5 pmp, and over 27,000 patients were on a waiting list in the Turkey at the end of 2014 [4,5]. Shortage of organ donation in Turkey is an important public health problem that needs to be resolved quickly because of both medical and economic losses [6,7]. The most important reason for the difference between donation supply and demand is insensitivity of individuals [8].

The primary problem of transplantation is the lack of sufficient organ donors. To solve this problem, the general public should give attention to the issue [9,10].

These data can be used in determining reasons why people decide whether to donate to eliminate barriers and increase organ donation rates. Therefore, causes of whether or not people donate organs should be examined [11]. Numerous factors influence the decisions of people toward organ donation, including knowledge, attitudes, and religion [12,13]. Knowledge regarding organ and tissue donation would be an important public health problem that needs to be resolved quickly because of both medical and economic losses [6,7]. The most important reason for the difference between donation supply and demand is insensitivity of individuals [8].

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plays an important role in the decision to donate [14,15]. Studies have clarified that people who want to donate their organs usually understand the transplantation process and general information about organ donation [16,17]. These studies have also shown that Turkish people have many misconceptions and lack specific knowledge of organ and tissue donation and transplantation. Specific knowledge of the organ tissue donation and transplantation process, such as brain death, medical-legal issues, and religious beliefs, provides guidance to people who have misconceptions and who lack information about organ donation [8,18–20].

In Turkey, nearly half of the society has a positive attitude about organ donation. However, many people do not know how to participate and lack general knowledge about organ donation [21,22]. This situation shows that if knowledge regarding organ donation increases in society, donation rates will increase. Previous studies that used surveys and measurement tools were not able to clarify the knowledge present in Turkish society regarding organ donation.

The present study was conducted to develop a scale for measuring the knowledge of organ tissue donation and transplantation and to assess its validity and reliability.

MATERIALS AND METHODS

Establish the Face and Content Validity of the Organ-Tissue Donation and Transplantation Knowledge Scale

Initially, we examined recent literature and educational materials from the Turkey Ministry of Health about organ tissue donation and transplantation. We performed a comprehensive literature review and discovered items that measured knowledge levels regarding organ tissue donation and transplantation. We chose 23 items for the scale according to specialists’ recommendations.

The items were assessed in 2 domains: “donor characteristics” (numbers 1 to 5, 15) and “legal, ethics, medical process related to organ tissue donation and transplantation” (numbers 6 to 14, 16 to 23). Items consisted of complete sentences of correct or incorrect statements. We asked nonmedical staff to answer “right,” “wrong,” or “do not know” for each item. Eleven of the items were incorrect statements (numbers 2, 6, 8 to 11, 15, 18, 20, 22, 23).

The Organ-Tissue Donation and Transplantation Knowledge Scale (ODTKS) benefited from several other scales, questionnaires, guidelines, and studies: items 1, 8 to 14, 16 to 18, 20, 22 were created from the educational materials of the Turkey Ministry of Health [5]; items 2, 5, 15 were derived from the questionnaire Knowledge of and Attitudes Toward Organ Donation: A Survey of Medical Students in Puerto Rico [23]; items 3, 4, 6, 19, 21 were obtained from a questionnaire in the Development of the Organ Donation and Transplantation Knowledge Survey for Use in Asian American Adolescents [24]; item 7 was obtained from a questionnaire asking whether medical students have the knowledge needed to maximize organ donation rates [25]; and item 23 was derived from the International Registry in Organ Donation and Transplantation 2013 report [4]. Items 2 to 6, 15, 19, 21, 23 were translated into Turkish and back-translated into English.

Ten experts including 3 epidemiology specialists, 1 nephrologist, 1 general surgeon, 1 ethicist, 3 public health research assistants, and 1 Turkish language specialist were asked to review the items in the scale to determine the construct validity. They were asked to assess the items in 3 groups: “essential,” “useful but inadequate,” or “unnecessary.” According to the specialists, item 23, “The number of deceased donor in Turkey is higher than in many European countries,” was unnecessary and was excluded from the scale. A Turkish language specialist evaluated the completed scale, and necessary changes were made.

Study Group and Procedure

The Ethics Committee of Eskisehir Osmangazi University and Eskisehir Osmangazi University Medical Practice and Research Hospital Management reviewed and approved the study. Verbal consent was obtained from the participants.

The study was performed in Eskisehir, which is a province located in central Turkey with a population of 790,000. There are 2 universities in the city and 2 medical schools.

The study was carried out in Eskisehir Osmangazi University Medical Practice and Research Hospital between December 2014 and March 2015. There were 742 nonmedical staff working in the 900-bed hospital, which provided service to a 110,000 m² area. The minimum sample size was calculated as 460 staff based on the statement “sample size should be 10 to 20 times the number of items in the study questionnaire” [26]. However, we assumed that individuals may be lost during the test-retest period. Therefore, the sample size was increased by about 20%, and questionnaires were completed by 540 (72.7%) individuals.

In accordance with the purpose of the study, a 2-part questionnaire was prepared. The first part focused on the sociodemographic characteristics, including age, sex, education level, marital status, monthly income of family, family status, personal/family status of physician-diagnosed diseases, family members performed transplant, willingness to donate, and having a donation card. We determined the socioeconomic status of the participants according to their own expressions (i.e., poor, moderate, or good). The second part consisted of the ODTKS.

The questionnaire was completed by the researchers in a face-to-face conversation. Questionnaire administration required between 20 and 25 minutes to complete. Retests were performed 2 weeks after the first application. Nonmedical staff who were not in the hospital, who answered less than 90% of the questionnaire, or who did not complete the retest were excluded from the study.

Analysis

Discrimination and Difficulty Indices. Difficulty and discrimination indices were calculated for each item. The difficulty index confirms that an appropriate range of results is assessed for the population under study. Knowledge questions should not be too easy or too difficult, and an appropriate range falls between 20% and 80% correct responses. This index is calculated using the formula $P = (L + H/N) \times 100$, where $P$ is the item difficulty index, $H$ is the number of nonmedical staff answering the item correctly in the high-achieving group, $L$ is the number of nonmedical staff answering the item correctly in the low-achieving group, and $N$ is the total number of nonmedical staff in these 2 groups. Other reliability tests include measures of robustness, such that tests can differentiate based on a range of ability (eg, high or low knowledge). This factor was measured quantitatively using an item discrimination index, which measures the ability of the item to discriminate between participants who do well on the test and participants who do not. The discrimination index was calculated using the formula $d = (H - L/N) \times 2$. The suggested criterion for inclusion is that items should correlate with the total score by a value of 0.20 [27]. The upper limit was 80% for the
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