

Turkish validity and reliability of Organ Donation Attitude Scale

Yazile Yazici Sayin

Aims and Objectives. To report the translation and adaptation process from English to Turkish and the psychometric estimates of the validity and reliability of The Organ Donation Attitude Scale Turkish. Its aim (1) is to provide data about and (2) to assess Turkish people's attitudes and volunteerism towards organ donation.

Background. Lack of donors is a significant problem for organ transplantation worldwide. Attitudes about organ donation and volunteerism are important factors in the lack of donors.

Design. To collect survey data from Turkish participants, a cross-sectional design was used: the classical measurement method.

Methods. The Organ Donation Attitude Scale was translated from English to Turkish and back-translated into English. The analysis included a total of 892 Turkish participants. The validity of the scale was confirmed by exploratory factor analysis and criterion-relation validity testing. A test-retest procedure was implemented for the reliability of the scale over time.

Results. The Organ Donation Attitude Scale consists of three relatively independent components: humanity and moral conviction, fears of medical neglect and fears of bodily mutilation. Internal consistency of these three components resulted in acceptable Cronbach's α levels. Positive correlation occurred between the volunteerism score and positive attitude about organ donation. The correlation between volunteerism score and negative attitude about organ donation was negative. Fears of bodily mutilation were most significantly related to unwillingness to commit to organ donation. The test-retest correlation coefficients proves that the Organ Donation Attitude Scale were reliable over time.

Conclusion. The Organ Donation Attitude Scale Turkish version is both a reliable and valid instrument that can be useful in measuring positive and negative attitudes of Turkish people about organ donation.

Relevance to clinical practice. With the Organ Donation Attitude Scale, researchers in Turkey will be able to ascertain important data on volunteerism and attitudes towards organ donation. Thus, positive attitudes towards cadaver organ donations will be able to encourage organ donation in Turkey.

Key words: adaptation, the organ donation, translation, Turkish

Accepted for publication: 31 May 2015

Author: Yazile Yazici Sayin, PhD, Assistant Professor, Nursing Department: Surgical Nursing, Faculty of Health Sciences, Bezmialem Vakif University, Istanbul, Turkey

Correspondence: Yazile Yazici Sayin, Assistant Professor, Nursing Department: Surgical Nursing, Faculty of Health Sciences, Bezmia-

lem Vakif University 34093, Istanbul, Turkey. Telephone: +90 536 253 65 79.

E-mails: yaziledoc@gmail.com, ysayin@bezmialem.edu.tr

What does this study contribute to the wider global clinical community?

- To determine the attitudes and behaviour of people in the Turkish society, valid and reliable instruments are needed that are appropriate for that society. The Organ Donation Attitude Scale (ODAS) is a valid and reliable instrument for determining attitudes about organ donation in Turkey.
- Because of its validity and reliability in Turkey, the ODAS can help add to the international database about attitudes concerning and volunteerism for organ donation.
- Using the ODAS, nurses can identify obstacles to organ donation and plan efficient consultation services.
- ODAS can focus researchers' attention on the attitude construct in the hopes of alleviating the shortage of donors.

Introduction

As in the rest of the world, diseases that can be cured by organ and tissue transplantation are among the important health problems in Turkey (Abouna 2008, Ganikos 2010, Arslan *et al.* 2014). The International Registry of Organ Donation and Transplantation (IRODaT) statistics data revealed that the ratio of cadaveric solid organ donors (CSODs) was three per-million-population (pmp), 3.6 pmp and 4.5 pmp for Turkey in 2007, 2008 and 2011, respectively. On the other hand, the ratio of living organ donors was 16.9 pmp, 24.1 pmp, and 43.2 pmp in 2007, 2008, and 2011 (Manyalich *et al.* 2009a,b, IRODaT 2013). It was indicated that CSODs ratio is much higher in various Western and European countries: UK, Spain, Latvia, Israel, Belgium, Portugal, Austria, Norway, Uruguay and Germany than Turkey (Arslan *et al.* 2014).

Background

Worldwide, the first choice for transplantation is the donation of organs and tissues coming from cadavers. Increasing the number of cadaver donors would reduce the risk of endangering the lives of healthy people for organ donation. Transplantations from living donors are legal, but more donations from cadavers should be encouraged (Kocak Suren 2007, Abouna 2008, Ganikos 2010). In Turkey, the vast majority of organ donations typically come from living family members (mothers, siblings, and fathers), which appears to indicate that some form of 'compulsory volunteerism' drives the donor system (Kapuogasi *et al.* 2011, Guzel *et al.* 2013).

Studies suggest that some of the important obstacles standing in the way of cadaver donations in Turkey are religious considerations, ignorance, lack of confidence in the health services, shortcoming in the legal system, socio-cultural structure and family relationships. Nevertheless, as studies have not been conducted by using an objective scale, attitudes about organ donations have not been explained adequately (Kilic *et al.* 2010, Guzel *et al.* 2013, Turkyilmaz *et al.* 2013, Uskun & Ozturk 2013). These attitudes could be explored via development, adaptation, and use of reliable, valid instruments appropriate for Turkish populations. Such instruments would disclose the attitudes of the Turkish society so that solutions could be quickly found and disseminated.

Today, numerous scales have been developed that attempt to understand the attitudes of the people towards organ donation. The Parisi and Katz (1986) Organ Donation Attitude Scale (ODAS) is one of those instruments.

ODAS was adapted by Kent and Owens (1995), which expanded its applicability. The scale has demonstrated effectiveness and reliability in explaining the attitudes of the people towards organ donation across different cultures and languages in countries such as China, England, New Zealand (Parisi & Katz 1986, Kent & Owens 1995, Cantwell & Clifford 2000, Boey 2002). The aim of this article is to impart information about the English-Turkish translation and adaptation process, and psychometric assessments for validity and reliability of the Turkish version of the ODAS modified by Kent and Owens (1995) from an original tool devised by Parisi and Katz (1986).

Methods

Design

To collect survey data from Turkish participants, a cross-sectional design was used: the classical measurement method.

Setting

The study was conducted in Gebze, Izmit and Marmara. Gebze, the district that receives the highest number of immigrants in Turkey, is considered representative of Turkey's sociocultural and political structure. Out of the nine high schools in Gebze, ANIBAL Anatolian High School, was selected as the study site. In addition to providing the required diversity in target group, the high school also offered the easiest and most economical means, in terms of time and cost of reaching the target population. The school principal and the guidance teachers were well-known and willing to assist with recruitment of study participants.

Sample

This study was conducted on the parents and relatives of students attending ANIBAL Anatolian High School. The advantage of selecting the ANIBAL Anatolian High School site was the ability to select a large sample containing a range of young and middle-aged participants to ensure the reliability of the scale sufficiently. The inclusion of young and middle-aged people in testing the ODAS also represented younger donor population in Turkey.

The ideal age interval in organ donation is 18–55 years of age (Yuksel *et al.* 2014). Various studies performed in Turkey revealed living donor mean age as 42.2 ± 9.4 , 50.6 ± 9.9 , 41.2 ± 14.5 (Yakupoglu *et al.* 2009, Ozden *et al.* 2010, Turkmen *et al.* 2013), and cadaver donor mean

age as 34.8 ± 15.2 , 49.1 ± 15.7 respectively (Turkmen *et al.* 2013, Yuksel *et al.* 2014).

A total of 1472 students' parents and relatives (siblings, aunts and uncles, grandparents, etc.) constituted the sample for the study. The sampling criteria was age (18 years or over), literacy (able to speak and write Turkish) and not working in the health services. Of the total samples, 1128 met these criteria. All criteria appropriate individuals were sent study invitations by the students attending the school of which 182 invitation cards were not returned. The students reported that they forgot to deliver or lost the invitation cards. The number of the completed research packs totalled 946. Of the complete packets, 54 were excluded because of incomplete forms (to be missing one or more questions), leaving a final sample population of 892.

By using a power analysis as a base, an *a priori* prediction of sample size determined sample size, the number of variables and the study data. The number of the individuals in the sampling could be determined with regard to the number of items in the scale in principal component analysis (10:1 or 2:1–30:1; Osborne & Costello 2004).

Theoretical framework for instrument choice

Socio-cultural structure and religious beliefs of Turkish society make family members feel responsible for each other. In the case of a health problem, family members are expected to make extensive personal sacrifices for each other; otherwise, the individual will experience adverse social pressure such as bad parents, spouse. As a result, the number of the relative donors is high when compared to international averages. In particular, women are expected to make more sacrifices, and, therefore, assume the greatest burden for these donations. Social expectations about the role of Turkish women in the family is thought to underpin the high rate of female organ donations (Yakupoglu *et al.* 2009, Guzel *et al.* 2013).

According to the Theory of Planned Behaviour, attitudes and behaviours about organ donations in the society should be determined by using instruments that disclose intentions and beliefs, whether newly developed or by adapting an existing scale appropriate to the target society (Kent & Owens 1995, Kaca *et al.* 2009). As developing a scale is quite expensive, adapting and translating a valid, reliable scale would enable researchers to exchange data more cheaply (Prieto 1992, Degroot *et al.* 1994). For this reason, adapting a scale was considered to be more useful for revealing attitudes of Muslim Turks towards organ donations.

The ODAS has been used to measure volunteerism and attitudes towards organ donations (Parisi & Katz 1986,

Kent & Owens 1995, Cantwell & Clifford 2000, Boey 2002). It had not been translated and adapted or tested for reliability and validity in the Turkish population. This is a new adaptation of ODAS.

ODAS was examined by research. It was concluded that this scale could help determine volunteerism and attitudes (positive and negative) towards organ donation in Turkish society.

Research instrument

The Cronbach's α score of ODAS used in the study presented was indicated as 0.88 and 0.89 by Parisi and Katz (1986) and as 0.91 and 0.89 by Kent and Owens (1995), respectively, for the positive (23 items) and negative (23 items) that it included. Both sets of researchers stated that ODAS had an acceptable internal consistency. They also recommended that ODAS should be tested on different groups to simplify terminology and identify redundancy in statements to further improve the reliability scores.

Based on the recommendations of the prior researchers, Cantwell and Clifford (2000) as well as Boey (2002) confirmed ODAS reliability by reporting Cronbach's α score of ODAS as 0.88 and 0.89, 0.80 and 0.86, respectively, for the positive and negative statements. However, while Cantwell and Clifford (2000) used all 46 statements of the ODAS, Boey (2002) included only 38 of the attitudinal statements in his study. This variation in the test instrument, imparts the necessity to retest the attitudinal statements of ODAS further continuing to add information to the body of knowledge about the scale's reliability across culturally diverse populations.

The Kent and Owens (1995) modified scale was employed in this study. The questionnaire consists of three parts. Part 1 questions focus on socio-demographic features of the participants. Part 2, the ODAS, includes 46 attitudinal statements about organ donation. Part 3 contains 15 questions about past experiences of the participants with organ donation.

Part 2 (ODAS) consists of a Likert scale of six options. The respondent is asked to state how they feel about each statement. Responses range from 'strongly agree' to 'disagree strongly', with no neutral option. Positive and negative dimensions of attitude about organ donation are measured through these statements. Kent and Owens (1995) state 'the positive scale focused on benefits of donation and feelings of fulfilment experienced by the donating family'. The negative scale focuses on fears of mutilation, fatalism and the fear of premature death if donor cards are signed. Validity and reliability analyses were recommended

to ensure cultural compatibility of the ODAS 46 attitudinal statements. Validity and reliability analyses were not necessary for Part 1 and 3 of the questionnaire. Researchers were able to make modifications as they deemed necessary (Kent & Owens 1995). Kent and Owens (1995) recommended that the researchers include questions about the socio-demographic features of the population and participant willingness and/or experiences with donating organs in Part 1, and 3 of the questionnaire.

The Part 3 addresses a number of issues such as willingness to donate organs. Personal acceptance of organs and specific organ refusal are also explored in this section. Questions in this section are phrased in such a way that respondents indicate a 'yes,' 'no,' or 'maybe/don't know,' but also offer the opportunity to comment on their responses for some questions (Kent & Owens 1995). One modification for Part 3 of this study involved the question related to signing a donor card. This question used six options from Parisi and Katz (1986) and five options from Kent and Owens (1995). For example, Item 1: 'I do not want to donate any of my parts after I die and I do not want to sign a donor card'... Item 5: 'I have already signed a donor card'. These were scored 1 (Item 1) through 5 (Item 5), with higher scores indicating greater commitment to organ donation (Kent & Owens 1995). Kent and Owens (1995) adapted this item in their version of the questionnaire. Subsequently, Cantwell and Clifford (2000), and Boey (2002) used this question in the same manner; therefore the question was included in the present study without further changes.

The potential scores on the ODAS can range from 46 to 276. Negative attitudes are indicated by scores under 161, and positive attitudes by scores 162 and above.

Ethical considerations

The data collection process started with the receipt of written approval for Bezmialem Vakif University's research ethics committee (number: 71306642/050-01-04/36), the Izmit district National Education directorate and the Izmit governorate (number: 99332080-355-03-00/01809) (May, June and September 2013). Written permission to use the Kent and Owens questionnaire was sought and obtained.

Data collection

To reach the target sampling group, the Gebze ANIBAL Anatolian High School principal and teachers assisted as needed after being informed about the study. The principal and the researcher sent letters to the students' families with

details about the study (including its name, aim and importance) along with an invitation and approval form. Those who agreed to participate in the study were identified and invited to school. Most of the participants stated that they could not come to the school. They either worked at a job, their home was far away or they had a patient/baby at their home. Only 281 participants accepted to come to the school on the weekend. They were informed of the day and time they would need to arrive at the school. They were informed about this study and were given research packs by the researcher. They filled the research form by themselves (approximately 25 minutes). Some of the participants wanted to learn why a question concerning a religious sect was included in the socio-demographic section. They expressed that this question was unnecessary as the participants were Muslim. The researcher explained that the question could be left unanswered, however, answering it would help render the research more comprehensive and scientific. Although they had hesitations participants answered this question, but some participants wrote next to that question, 'I think this question is unnecessary'. At the end of the research form, a space was provided for participants to write their opinion or comments concerning the study. The vast majority of the participants did not write any other comments. While submitting the form, many participants verbally shared that they found the '46 attitudinal statements' in Part 2 of the ODAS quite interesting. While reading these statements, some of the participants whose relatives who were waiting for organ donation said, 'What we went through is written in these lines of the questionnaire'.

Participants who agreed to participate in the study, but did not come to school were identified and sent two research packs by the teachers and the researcher. Participants were expected to complete and return the packs within two days. Included were an informative form and short instructions on how to fill out the questionnaire. One of the two forms sent to the family was to be completed by an adult woman and the other by an adult man. Participants were asked to sign the fully completed research consent form on the front page. The researcher's contact information was added and, in case of questions or problems, participants were encouraged to call (toll free) the researcher. Some of the participants added a 'thank you note' on their research packs, describing the scale as very impressive. One such participant provided a phone number, name, address and remarked, 'Please let me know if you need an organ, I will donate mine voluntarily'. Still another participant provided a name and added, 'I am always ready to help, let's found a club of volunteers on this subject'. In

addition, some of the participants who did not come to school ($n = 38$) wrote that the question regarding the religious sect was unnecessary, and one cautioned that the religious question was disturbing.

By using a test–retest procedure, a prediction was made about the validity of the ODAS. For this, 160 participants were randomly chosen, and 17 days after the first questionnaire, a second pack was sent to them to fill out again. Of the 160 packets sent the second time, 116 were returned completed. The 17-day gap was decided upon in accordance with the Ferris and Norton (1992) recommendation that a retest should be made 2–4 weeks after the first one to avoid the effects of memory.

In this study, the data were not all collected under the same conditions. For this reason Cronbach's α was analysed. Cronbach's α values were 0.796 and 0.879 for 281 individuals who came to the school and 611 individuals who did not come to school respectively. These values did point out that participants' perceptions on the ODAS emerged from similar cultural and linguistic influences; therefore, it was possible to evaluate both groups together ($n = 892$). In this study, data were analysed using Statistical Package for Social Sciences 16.0 for Windows (SPSS Inc, Chicago, USA).

Suggestions for the translation and adaptation process

Translation

While translating research instruments, care must be taken with colloquial language usage, idioms, meanings and other methodological challenges (Hilton & Skrutkowski 2002). The text should be translated by a professional translator which a native speaker of the language should then edit. In addition, the translation should be given to a target group for testing. Ideally, the measurement of a notion should be conducted taking into account the point of view of the target culture. Thus, a common consensus can be arrived at about relative notions, and culturally valid definitions can be included. No conventional criteria for this kind of translation exists, but the most common procedure is to translate the text into the target language and then to back-translate, i.e. to translate it back to the original language (Prieto 1992, Degroot *et al.* 1994).

Adaptation

In adaptation, balance between the original language and the target language is critical. Focus should be on meaning, not on specific words (Hilton & Skrutkowski 2002).

The translation and adaptation process consists of a number of steps. After the initial translation and back-translation, cultural coherence is evaluated by a group of

people who know only Turkish and who represent the target population. Meanwhile, bilingual professionals evaluate the content validity and finally psychometric tests are conducted to determine the equivalence, reliability and validity (Prieto 1992, Degroot *et al.* 1994).

The translation, adaptation, face, and content validity of ODAS

Translation

The translation of the ODAS took nearly five months by an experienced professional chosen to translate from English to Turkish. This was then retranslated by a target group composed of four independent bilingual nurses constituted in such a way to reflect the cultural and religious variability. Their families originate from different regions of Turkey. Four independent translators worked separately and the end-product was evaluated by a target group which included the primary researcher.

Adaptation

In the translation process, every word of the scale was compared in terms of meaning. Both the English and Turkish versions were compared by the target group for terminological equivalence. Consensus was built in the terminology used in subcultural word comprehension questions.

In Item 5, the target group wanted to add the word *ahiret* (the life after death) next to '...for the next life' to convey the meaning better. They changed the meaning of the 7th item (Organ donation interferes with an open-casket funeral service), claiming that these kinds of services do not take place in Islam. Sometimes the imam allows the family members to see the face of the deceased for one last time, but the only service is the funeral prayer, and for some Muslims organ donation interferes with the funeral prayer; therefore, this item was reworded to *organ bagislayan birinin cenaze namazi kilinamaz* (no funeral prayer is offered for ones who donated their organs). In Item 14, 'medical school research' was changed to 'medical doctor' as the target group thought undereducated people might have difficulty in understanding the true meaning of the expression. In Item 17, 'extraordinary medical techniques' was changed to 'whole bag of tricks of medical' to reduce confusion. In Item 18 (Organ donation is a way of honouring God), the word 'honouring' was translated as 'being grateful for,' as Muslims thank Allah for all the blessings they receive. Organ donation is a great blessing, so the person receiving one is grateful for such a gift. Item 23 (the body is sacred), as noted above, in Islam the body is considered an entrustment; therefore, this was translated as *body is a God's entrust*.

In Part 1 of the scale, nearly the same form was used for the socio-demographic features (except religion). It was concluded that providing more options to the open-ended questions at the end of Part 3 would increase the number of answers, thus 'heart, eye, skin, kidney, face, skin, extremities, lung, liver, pancreas, bowel, genitalia, spleen, etc.' were added to Question 48 (The organs you never consider donating) and one option was left open-ended (Others:...). Question 59 (The UK system for donating organs...) was changed to 'the Turkish system for donating organs'. Options were added to the parts questioning the suggestions about organ donations, and an open-ended item was included (Other suggestions:..).

Face and content validity

To test the face and content validity and to determine cultural compatibility, 25 monolingual individuals were chosen (13 women, 12 men). Independent of subcultures, participants found the text clear and comprehensible and offered no changes.

The scale was evaluated by bilingual health care professionals and educators for content validity: a religious cleric, a faculty member in the humanities, a researcher, a primary health care institution medical director and doctor, a lawyer and two professional healthcare professionals. Each person evaluated the text's content, meaning equivalence and cultural compatibility. The scale was now considered ready to use for data collection from the target group for psychometric tests.

Results

Defining characteristics of sampling

The youngest of the participants was 18 years old (3 people) and the oldest 67 years of age (1 person). Of the participants 84.4% were between 30–55 years of age. Participants were further categorised by demographics as follows: 50.4% women, 49.6% men, 5.3% lived with parents or extended family, 7.5% lived alone, 91.5% were married, 87.2% lived with a spouse in a nuclear family and 85.6% had dependents of which 42.2% had four or more. As to the financial status, 78.0% of them classified themselves as middle class and 17.1% as lower class. Of the 55.3% who worked, 24.3% were women and 75.7% were men. All but 0.1% of participants had health coverage; all were Muslims: 81.3% Sunni, 5.9% Shafii and 12.8% Alawite. Educational levels broke down to 49.7% primary school graduates, 33.2% high school graduates and 17.2% university graduates.

The organs that the participants considered to be the most important to donate are: heart (81.7%), kidney (75.1%), bone marrow (68.5%), lung (63.8%), cardiac valve (63.6%), eye (63.2%), liver (62.2%), pancreas (44.3%), skin (38.7%) and bone (38.0%).

The organs that the participants never consider donating are: genitalia (93.6%, thinking that it would be adultery), heart (64.7%, mostly emotional reasons: darling, love), eye (61.8%, mostly for the fear of bodily mutilation plus religious concerns, i.e. looking at something or somebody forbidden by religion), face (41.6%), extremities and skin (40.2% and 38.2% respectively). The most preferred donor types were human (66.5%), and/or artificial (59.6%); 92.8% of the participants wanted to be buried after death, 4.6% wanted to be donated for scientific research and 2.6% wanted to be frozen. Most (90.9%) of the participants did not know how the organ donation system worked in Turkey; 63.9% stated that donor safety should be provided.

For purposes of the present analysis, signing a donor card was adopted as an operational definition of commitment. Most (62.5%) of the participants expressed hesitation or wanted to sign a donor card in the future; 12.1% definitely wanted to donate organs and sign a donor card.

This study did not discuss data regarding socio-demographic and organ donation volunteerism. The data were also used to explain the results of psychometric analysis of ODAS and to show the general characteristics of the sampling.

Psychometric estimates of reliability and validity

The psychometric properties were examined further to determine appropriate reliability and construct validity using a multiple analytical approach. To identify underlying dimensions of the items in ODAS, an exploratory factor analysis was conducted using principal component analysis (Osborne & Costello 2004).

To examine internal consistency reliability of the ODAS, item-total correlations and Cronbach's α coefficient were used. Item-total analysis was used to demonstrate the correlation between the respective items and the summated scale score (without the respective item), and the coefficient α if the respective item was deleted. Given that the reliability of individual items can affect the size of α , items that do not achieve a high correlation are often deleted from the scale (Nunnally & Bernstein 1994). In the present study, items with an item-total correlation coefficient less than 0.20 were discarded to improve scale homogeneity. Furthermore, a test-retest procedure was conducted to provide evidence

of reliability over time (Tabachnick & Fidell 2001, Balci 2011).

Construct validity

The appropriateness of the data for factor analysis can be explained by the Kaiser–Meyer–Olkin (KMO) coefficient and Bartlett's test (Hair *et al.* 1998, Tabachnick & Fidell 2001, Buyukozturk 2012). Table 1 displays the KMO, Bartlett's test result and the factor matrix of the study. The KMO coefficient (0.940) indicates that the sample size in this study was adequate. Bartlett's test ($\chi^2 = 17,196.36$, $p = 0.000$) disclosed correlation among the instrument items, and the data were appropriate for factor analysis.

Factor loading value is a coefficient describing the relationship of the items with the factors. The loading values of the items in the factors are expected to be high. Higher values are thought to indicate the amount of variance in one variable which is shared by all of the other variables. Low values, on the other hand, are considered to indicate that the variables are unreliable (Hair *et al.* 1998, Tabachnick & Fidell 2001).

Principle component analysis was performed to determine if factors empirically extracted would correspond with the dimensions used for constructing the scale. To determine the contribution of each item in the instrument to this validity, the factors were rotated orthogonally by using the varimax procedure with Kaiser Normalization. To explain the structure of the factors, a 'scree plot' graphic was constructed. A scree plot is a graphical display of the variance of each component in the dataset which is used to determine how many components should be retained to explain a high percentage of the variation in the data (Hair *et al.* 1998, Tabachnick & Fidell 2001). The scree plot indicated clearly that three factors were relatively important in accounting for the total variance of the scale, thus three factors were retained for further statistical analysis (see Fig. 1). Judged by the item content of these factors, they were named, respectively, humanity and moral conviction (HMC) (Factor 1), fears of medical neglect (FMN) (Factor 2) and fears of bodily mutilation (FBM) (Factor 3). According to this three-factor structure, however, the common factor variance (communalities) (0.057) and factor load (0.219) of Item 7, and the communalities (0.165) and factor load (0.322) of Item 45 were too low. Items 12, 19 and 27, on the other hand, had close relations with more than one factor. The reliability analysis of Item 6 revealed that corrected item-total correlation value was negative. In the light of this analysis, items 6 (To donate one's organs after death is an act of charity), 7 (Organ donation interferes with an open-casket funeral

service), 12 (Transplanting organs is against God's will), 19 (Organ donation is a way to make up for past wrong doing), 27 (It is unnatural to prolong life body replacements) and 45 (It is a shame to deny a person the organs he or she needs to keep the body functioning) were discarded and factor analysis was repeated. The result of this last analysis showed that load values of the items in Factors 1, 2 and 3 were 0.720–0.435, 0.742–0.464 and 0.772–0.513 respectively (see Table 1).

Reliability

Internal consistency. Cronbach's α value and the test–retest procedure was used in this study to determine reliability. Table 2 shows the Cronbach's α of the subscales. In this study, reliabilities of the three-factor scores were found to be highly satisfactory, with Cronbach's α ranging from 0.858–0.850. Cronbach's α for the entire 40-item scale ($n = 892$) was 0.857 (see Table 1): 0.925 for the positive dimension questions (Factor 1) and 0.914 for the negative dimension questions (Factor 2 and 3). Cronbach's α estimation in each subscale is HMC $\alpha = 0.925$, FMN $\alpha = 0.869$ and FBM $\alpha = 0.883$ (see Table 2).

These values demonstrated that the scale items measured similar features with high reliability. The Cronbach's α value, however, is not sufficient for construct validity; therefore, the power of the correlation of each subscale must also be analysed.

Item analysis and internal consistency. Cronbach's α was calculated for all subscales and for the entire scale. The results of the item analysis and internal consistency are presented in Table 2. The corrected item-total correlation value of this study was between 0.494–0.171. The lowest values belonged to Item 25 (0.171) and Item 28 (0.190), of which the latter also had the lowest communalities (0.198). An acceptable 'corrected item-total correlation' value of a scale must be positive and greater than 0.20 or even 0.30. Communalities must be >0.10 and even 0.20 (Tabachnick & Fidell 2001, Buyukozturk 2012). Nevertheless, as excluding these articles did not significantly increase the Cronbach's α value of the scale, items 25 and 28 were retained. Factor values of the rest of the 40 items were 0.772–0.435 and explained 46.96% of the total variance (see Table 1). These values showed that factor structure had strong items. According to the studies in social sciences, an acceptable total variance explained rate of the items is a scale falling between 40–60% (Balci 2011, Buyukozturk 2012).

This study considered a Tukey estimate of power to which observations must be raised to achieve additivity.

Table 1 Summary of items and factor loading for varimax orthogonal factor solution for the Organ Donation Attitudes Scales Turkish Version ($n = 892$)

Items	Factor loading			Communalities
	1	2	3	
Humanity and moral conviction				
46. Promising to donate is a genuine and unselfish act	0.720	-0.084	-0.131	0.543
30. By agreeing to donate my organs after death, I am giving some people hope for survival	0.718	-0.077	-0.066	0.526
22. Hearing about people whose lives were saved after the receipt of an organ makes me think about the importance of donating my organs after death	0.718	-0.083	-0.067	0.527
41. By donating an organ at death, one can offer someone a better chance of being cured	0.718	-0.192	0.032	0.553
43. Donating an organ after my death would make me feel proud of myself	0.712	-0.063	-0.076	0.516
33. Organ donation benefits the whole of humanity	0.703	-0.199	-0.087	0.541
39. By donating a body part after my death, I could keep another person living	0.698	-0.112	-0.173	0.530
24. Donating organs at death is a way of putting some parts of the body to beneficial use	0.693	0.097	-0.255	0.554
9. Deciding to donate one's organs at death adds extra meaning to life	0.692	0.012	-0.106	0.490
13. Vowing to donate organs at death is a highly moral act	0.690	0.088	-0.131	0.501
26. The person who offers a part of his or her body for transplantation is making a really precious gift	0.673	-0.082	-0.075	0.465
36. Life is much too valuable to be cut short by a bad heart or kidneys, especially when organ donation can help to solve the problem	0.656	-0.168	-0.009	0.458
8. By agreeing to donate organs at death, one sets a good example for others to follow	0.629	-0.195	-0.060	0.437
15. Vowing to donate organs at death makes one more respected and admired by family and friends	0.612	-0.028	-0.017	0.375
32. Organ donors are special people	0.601	0.149	-0.188	0.419
11. Organ donation endows death with more meaning and worth	0.577	0.276	-0.183	0.443
18. Organ donation is a way of being grateful for God	0.552	0.343	-0.162	0.448
1. A person willing to donate is almost a hero	0.546	0.178	-0.142	0.350
3. Donating a body part would enable that part of myself to remain alive after my death	0.517	0.045	-0.089	0.277
28. People have a moral responsibility to donate some of their body parts to people in need	0.435	-0.005	-0.095	0.198
Fears of medical neglect				
20. A person will be less likely to receive adequate medical care after signing a donor card	0.000	0.742	0.219	0.599
21. There is a good chance that doctors will be more likely to prematurely declare the death of a person who has signed a donor card	-0.019	0.726	0.242	0.586

Table 1 (continued)

Items	Factor loading			Communalities
	1	2	3	
29. A potential donor's death will be met by pleasure rather than by vigorous medical treatment by doctors	0.027	0.692	0.148	0.501
35. A person who intends to donate their body parts at death increases the likelihood that one will be pronounced dead even though one is still alive	-0.111	0.680	0.256	0.541
23. Organ donation should not be considered because the body is a God entrust and has religious meaning after death	0.000	0.643	0.161	0.439
37. By signing a donor card, doctors might do something to me before I am really dead	-0.101	0.639	0.304	0.511
17. Whole bag of tricks of medical will not be used to save the life of someone who has signed a donor card	-0.041	0.601	0.259	0.430
42. Even if special precautions were taken to protect the life of a person who has signed a donor card, there is still a chance that their life will be taken to save the life of a rich or important person	-0.097	0.562	0.296	0.413
14. Medical doctors who remove organs do not treat the body in a dignified manner	0.316	0.501	0.055	0.354
4. Organ donors cannot control which organs will be taken even when specified in advance	-0.065	0.464	0.233	0.274
Fears of bodily mutilation				
34. When I die I want the whole of my body to die with me	-0.217	0.219	0.772	0.691
40. The thought of my body being cut up or taken apart after I'm gone makes me feel uneasy	-0.164	0.186	0.738	0.606
44. When I die I want to be buried whole and with all my original parts	-0.184	0.073	0.734	0.578
31. Promising to donate my organs upon my death makes me feel uncomfortable	-0.224	0.343	0.626	0.559
2. Organ donation leaves the body disfigured	-0.109	0.292	0.596	0.453
25. The surest way to bring about my own death is to make plans for it, like signing a donor card	-0.260	0.198	0.582	0.445
10. Other members of my family would object to me signing an organ donor card	-0.078	0.273	0.580	0.417
16. Preparing to become an organ donor brings to mind unpleasant thoughts of my own death	0.034	0.292	0.576	0.418
38. A person with someone else's heart, eyes, kidney etc. is not the same person	-0.106	0.426	0.546	0.491
5. An intact body is needed for the life after death	-0.098	0.236	0.513	0.329
<i>Eigenvalues</i>	8.797	5.164	4.825	
<i>% Of variance</i>	21.991	12.911	12.063	

KMO and Bartlett's Test: 0.940. $p = 0.000$. Boldface indicates highest factor loadings.

ODAS Cronbach's Alpha (α) = 0.857: Positive dimension items Cronbach's $\alpha = 0.925$; Negative dimension items Cronbach's $\alpha = 0.914$.

The correlation coefficient of ODAS $r = -0.327$. Factor 1 showed a negative relation to Factor 2 ($r = -0.133$, $p < 0.001$) and Factor 3 ($r = -0.416$, $p < 0.001$). The correlation between Factors 2 and 3 was $r = 0.597$, $p < 0.001$.

Results showed the following: HMC: 1.662, FMN: 0.120 and FBM: 0.672. Significant bivariate correlations were detected among all of the subscale items. Spearman's ρ ,

the inter-item correlation coefficient of the subscale, was significant ($p < 0.01$) (see Table 2): 0.173–0.618 ($p < 0.01$) for HMC, 0.133–0.625 ($p < 0.01$) for FMN, 0.289–0.640

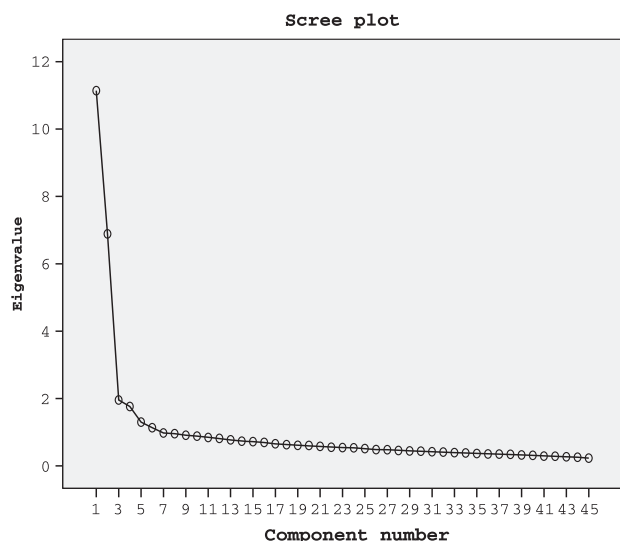


Figure 1 Scree plot for factor solution of items in the Organ Donation Attitudes Scales Turkish version ($n = 892$).

($p < 0.01$) for FBM. The Tukey power analysis and correlation coefficients showed that the items had a high correlation power with each other for each of the subscales of the instrument and they accounted for their structure adequately on the subscales.

In this study, the correlation coefficient of ODAS between the dimensions which were positive (Factor 1) and negative (Factors 2 and 3) is -0.327 : Factor 1 showed a negative relation to Factor 2 ($r = -0.133$, $p < 0.001$) and Factor 3 ($r = -0.416$, $p < 0.001$). The correlation between the two negative components (Factors 2 and 3) was substantially higher ($r = 0.597$, $p < 0.001$; see Table 1).

Table 3 shows the relation between the participants' volunteerism and attitudes towards organ donation. A low but positive correlation occurred between the volunteerism score and positive attitude about organ donation ($r = 0.489$, $p < 0.001$). The correlation between volunteerism score and negative attitude about organ donation was negative ($r = -0.519$, $p < 0.001$): -0.314 for FMN and -0.599 for FBM.

In summary, a statistically significant relationship exists among all of the subscale items. The positive and high correlation of the total item test score and high Cronbach's α values indicated that the Turkish version of the ODAS had internal consistency.

Reliability over time. The test-retest results of this study are shown in Table 3. Spearman's ρ levels of the subscales of the Turkish ODAS are HMC 0.892 (very strong), FMN 0.834 (strong) and FBM 0.765 (strong).

Discussion

The psychometric estimates, preliminary evidences for the reliability and validity

In this study, the principle component analysis further confirms that positive items form one independent factor, while the two negative items form another group, namely, FMN (Factor 2) and FBM (Factor 3). These findings are similar to those of the ODAS analyses carried out by Parisi and Katz (1986) and by Boey (2002). In the present study, however, 21.99% of the total variance was contributed to by the Factor 1 (HMC), while 12.91% and 12.06% were by Factors 2 (FMN) and 3 (FBM) respectively. Boey (2002) showed 35% the total variance accounted for by the factors 1, 2, and 3: 18%, 12% and 5% respectively. Also, Boey (2002) showed 31% by Factor 2, 14% by Factor 3 (FMN), 10% by Factor 1 (HMC) of the total variance for the relationship between attitude and commitment to donate. The differences between this study and Boey's (2002) could have risen from the different sampling characteristics of each (religion, education, etc.). Comparison cannot be made with the study of Parisi and Katz (1986), as it had no psychometric characteristics to check for the negative and positive dimensions of the scale.

The internal consistency of items within the respective positive and negative dimensions is quite high (Cronbach's α of 0.857). These compare very well with reports by Parisi and Katz (1986), Kent and Owens (1995) and Boey (2002). These findings provide supportive evidence for the cross-national applicability of the ODAS.

This study shows a weak reverse correlation between the positive (HMC) and negative (FMN and FBM) dimensions of the ODAS with regard to correlation coefficient ($r = -0.327$, $p < 0.001$). A medium level positive correlation ($r = 0.597$, $p < 0.001$) arose between the two negative dimensions. Negative correlation between the positive and negative dimensions highlights their relative independence, and no correlation between scale dimensions is expected. For this reason, positive and negative dimensions had a reasonable difference in this study. These findings have similarities with those of Parisi and Katz (1986) and Boey (2002). In the present study, the division of the negative dimension of the ODAS indicates that the participants may have significant differences in negative attitudes. In Boey's (2002) study, positive and negative attitudes were independent. In his study, the correlation was positive even if it was weak. Age, education, beliefs, moral values, cul-

Table 2 Item analysis and consistency of the Organ Donation Attitude Scale Turkish version ($n = 892$)

Item No.	Content of item	Mean	SD	Corrected Item-Total Correlation	Cronbach α if Item Deleted	rho ^a
Humanity and moral conviction						0.173–0.618
46	Genuine and unselfish act	5.109	1.362	0.302	0.855	$p < 0.01$
43	Feel proud of myself	4.880	1.568	0.326	0.854	
41	Offer chance for being cured	5.239	1.271	0.306	0.855	
39	Keep other living	4.822	1.600	0.247	0.856	
36	Life valuable	5.033	1.474	0.262	0.855	
33	Benefit humanity	4.950	1.496	0.247	0.856	
32	A special people	4.349	1.791	0.343	0.854	
30	Giving people hope	5.132	1.491	0.326	0.854	
28	Moral responsibility	4.134	1.927	0.190	0.857	
26	Making a precious gift	4.907	1.519	0.290	0.855	
24	Putting body beneficial use	4.313	1.775	0.339	0.854	
22	Lives were saved	4.875	1.576	0.324	0.854	
18	A way of being grateful for God	3.574	2.036	0.437	0.851	
15	Respected and admired	4.208	1.651	0.316	0.854	
13	A moral act	4.542	1.717	0.387	0.853	
11	Endow death meaning	4.005	1.902	0.404	0.852	
9	Add extra meaning to life	4.924	1.532	0.353	0.854	
8	Set good example	5.250	1.274	0.213	0.856	
3	Remain alive after my death	4.376	1.870	0.272	0.855	
1	A hero	4.480	1.614	0.353	0.854	
<i>Cronbach's $\alpha = 0.925$</i>						
Fears of medical neglect						0.133–0.625
42	Life taken to save person	3.581	1.941	0.360	0.853	$p < 0.01$
37	Signing a donor card	2.875	1.930	0.411	0.852	
35	Pronounce death even alive	2.889	1.959	0.409	0.852	
29	Potential death not treated by doctors	3.116	2.018	0.452	0.851	
23	Body is sacred	2.650	1.891	0.415	0.852	
21	Prematurely declare death	2.970	1.905	0.490	0.850	
20	Less likely to received medical care	2.709	1.938	0.494	0.850	
17	Appropriate medical technique not used	2.907	1.902	0.399	0.852	
14	Body in a dignified manner	2.632	1.851	0.480	0.851	
4	Specified in advance	1.676	1.425	0.304	0.855	
<i>Cronbach's $\alpha = 0.869$</i>						
Fears of bodily mutilation						0.289–0.640
44	Buried with original parts	3.927	1.907	0.201	0.857	$p < 0.01$
40	Uneasy body being cut up	3.8576	1.951	0.282	0.855	
38	Not the same person	2.521	1.870	0.382	0.853	
34	Die with whole body	3.447	1.991	0.283	0.855	
31	Feel uncomfortable	3.466	1.976	0.285	0.855	
25	Own death is to make plans	2.767	1.863	0.171	0.858	
16	Unpleasant thought	3.456	1.869	0.396	0.853	
10	Family would object	3.507	1.942	0.317	0.854	
5	Intact body needed	2.804	1.981	0.258	0.856	
2	Body disfigured	3.321	1.859	0.316	0.854	
<i>Cronbach's $\alpha = 0.883$</i>						

Tukey's estimate of power to which observations must be raised to achieve additivity: Humanity and moral conviction 1.662, fears of medical neglect 0.120, fears of bodily mutilation 0.672.

^aSpearman's rho correlation.

ture and country's organ donation policy could affect this difference. Also, his 2nd factor represented FBM and the 3rd factor represented FMN. In addition, his study

excluded items related to FBM (items 4, 14, 25) and HMC (items 1, 3, 32, 39, 45). This study excluded items related to the participants' religious beliefs (items 7, 12,

Table 3 Correlations of commitment and attitudinal for organ donation ($n = 892$)

Attitude and commitment	r^a	p -value
Attitudes		
HMC-FMN	-0.133	0.001
HMC-FBM	-0.416	0.001
FBM-FMN	0.597	0.001
TNA-HMC	-0.327	0.001
Commitment situation		
Commitment-HMC	0.489	0.001
Commitment-FMN	-0.314	0.001
Commitment-FBM	-0.599	0.001
Commitment-TNA	-0.519	0.001

^aSpearman correlation.

HMC: Humanity and moral conviction, FMN: Fears of medical neglect, FBM: Fears of bodily mutilation, TNA: Total negative attitude.

Table 4 Test-retest correlations of the major theoretical variables ($n = 116$)

Variable	Test		Retest		rho
	Mean	SD	Mean	SD	
Humanity and moral conviction	98.043	17.908	105.129	10.826	0.892 ^a
Fears of medical neglect	27.155	12.088	33.336	9.958	0.834 ^a
Fears of bodily mutilation	31.569	10.849	37.853	10.794	0.765 ^a

^a $p < 0.01$, Cronbach's α for test group 0.759, Cronbach's α for retest group 0.685.

19, 27) and humanitarian behaviours (items 6, 45). These excluded questions may lead one to hypothesize that in Turkey, both FBM and moral values are more important than religious perception in defining attitudes about organ donation. Still, the results show similarities with other studies, supporting the idea that the ODAS could be used for international data collections.

While this study confirms the validity and reliability of the ODAS, some sampling characteristics also make it easy to describe the scale structure. The data about attitudes relating to organ donation volunteerism were compared to attitudes about organ donation. When compared, a definitive correlation arose between positive attitudes towards organ donation and volunteerism, but a mid-level correlation occurred between organ donation volunteerism and negative attitudes. To encourage organ donations all over the world, the same message is given: 'Please support!' However, this does not mean that people who have posi-

tive attitudes actually will donate their organs (Ganikos 2010). In the present study, a common characteristic found among study participants was hesitancy towards donating their organs. These findings are compatible with Boey's (2002) study, in which HMC was positively correlated ($r = 0.31$, $p < 0.001$), whereas FBM and FMN negatively related to the commitment to donate ($r = -0.56$, $p < 0.001$ and $r = -0.38$, $p < 0.001$). Conversely, Kent and Owens (1995) drew attention to the negative correlation between organ donation volunteerism and negative attitudes ($r = -0.49$, $p < 0.001$). According to Parisi and Katz (1986), assessment of attitudes about organ donation should consider both positive and negative dimensions. People may have humanitarian and charitable feelings about organ donation, but at the same time hesitate to commit because of FBM and FMN. Generally, the positive and negative dimensions were found to be relatively independent of each other.

In summary, when defining a person's attitude about organ donation, volunteerism should be taken into consideration. By using all three parts of the ODAS, meaningful data could be obtained from the different perspectives of different population groups.

Reliability over time

Test-retest reliability refers to the correlation coefficient obtained for any variable under the same conditions and after a certain time interval. These values fell into three categories: weak (<0.30), moderate and acceptable ($0.30-0.70$), and large or strong (>0.70). A test-retest score of less than 0.80 indicates that the participants did not answer the items the same way when retested (Ferris & Norton 1992).

The high correlation coefficient values show that for the two separate tests, participants read and understood the ODAS items in the same way. According to the results of the test-retest, subjects' positive and negative attitude marks both increased when they completed the scale for the second time. The correlation coefficient decreased (especially FBM), indicating that the second time, the test items were not perceived the same way. One reason could be that news coverage related to organ donations appeared in the Turkish media with both positive and negative viewpoints. Another reason is that during the time of the study, several TV series focused on primarily positive scenarios about organ donation. As the participants had heightened awareness because of being a part of this study, they may have had more interest in, and paid more attention to, anything in the media about organ donations.

In summary, this instrumentation study has provided confirming evidence that the Turkish version of the ODAS is a reliable and a valid instrument.

Limitations

Because the ODAS is a translated tool, it may be limited in reflecting all of the subtle contextual meanings of a language. Although they were asked to express their true feelings and ideas, the participants, being Turkish, may have instead responded in a way that is considered socially acceptable or expected in Turkish culture.

In this study, 30–55 years constituted the overwhelming majority of the sample group's age range. Even though the majority of donors in Turkey are young (Yakupoglu *et al.* 2009, Ozden *et al.* 2010, Turkmen *et al.* 2013), some donors are over 55 years old.

Strengths

The reliability and validity of the ODAS was tested in a metropolitan area where Turkey's socio-political-cultural structure is considered to be best represented. Limited interaction occurred between the researcher and the participants; they all participated voluntarily, so they should have felt free to answer as much as they desired. In addition, the validity and reliability of the ODAS was carried out with a large sampling size; therefore, this study truly represents typical attitudes of the Turkish society.

Conclusion and recommendations

Relevance to clinical practice

The factors and components that influence attitudes towards organ donation can be assessed by using reliable research instruments that are culturally relevant for the population of study. The ODAS can help add to the international database about attitudes and volunteerism about organ donation related to Turkey. These data provide international co-operation about organ donation among the health professionals.

Nurses can identify an association between attitudes towards donation and the act of becoming an organ donor. Using the ODAS, nurses can identify obstacles to organ donation and plan efficient consultation services. With the ODAS, nurses in Turkey will be able to ascertain important data on volunteerism and attitudes of themselves and others

concerning organ donation. They can, thus, mentor patients and families about organ donation.

Implications for future research

The findings reported here are limited to the study sample. As these are preliminary findings for the Turkish version of the ODAS, further testing of this scale is recommended by means of future studies. Replicating this study with similar and larger populations to improve the instrument could help confirm its results and eliminate random errors. In this study, ODAS was evaluated using overwhelmingly young sample. It would be interesting to perform a study that includes both older and younger individuals in the future.

With the help of organ donation campaigns, positive attitudes towards organ donations are being encouraged all over the world. Future trends may require a review of the dimensions of the scale; therefore, as for all other scales, validity and reliability analysis should be repeated for the ODAS.

Acknowledgements

The author thank Dr. Nina Parisi and Dr. Irwin Katz, plus Prof. Bridie Kent and R. Glynn Owens for developing and adapting the ODAS and providing the opportunity to translate and adapt it into other cultures and languages. In addition, I would like to thank Principal Servet KOC, the teachers and the students of Kocaeli ANIBAL Anatolian High School, and all the other participants who took part in this study. Finally, the author also appreciates the English editorial assistance and contributions made by Susan Delacroix, a native English speaker.

Contributions

Study design: YYS; Data collection and analysis: YYS; Manuscript preparation; YYS.

Funding

The author has no funding or conflicts of interest to disclose.

Conflict of interest

None.

References

- Abouta GM (2008) Organ shortage crisis: problems and possible solutions. *Transplantation Proceedings* 40, 34–38.
- Arslan MN, Esen Melez I, Melez DO, Cavlak M & Gur A (2014) Limitations of cadaveric organ donation on judicial cases and problems confronted in autopsy: Istanbul data in comparative perspective. *Forensic Science International* 237, 131–136.
- Balci A (2011) *Research Methods, Techniques, and Principles in Social Sciences*, 9th edn. Ankara, Pegem Akademi Publishing.
- Boey KW (2002) A cross-validation study of nurses' attitudes and commitment to organ donation in Hong Kong. *International Journal of Nursing Studies* 39, 95–104.
- Buyukozturk S (2012) *Data Analysis Handbook for Social Sciences*, 16th edn. Ankara, Pegem Publishing, Cankin Printing House.
- Cantwell M & Clifford C (2000) English nursing and medical students' attitudes towards organ donation. *Journal of Advanced Nursing* 32, 961–968.
- Degroot AMB, Dannenburg L & Vanhell JG (1994) Forward and backward word translation by bilinguals. *Journal of Memory and Language* 33, 600–629.
- Ferris L & Norton P (1992) Basic concepts in reliability and validity. In *Tools for Primary Care Research* (Stewart M, Tudiver F, Bass M, Dunn E & Norton P, eds). Sage, Newbury Park, CA, pp. 64Y76.
- Ganikos M (2010) *Organ Donation an Overview of The Field. Understanding Organ Donation* (Siegel JT & Alvaro EM eds). Willey-Blackwell, <http://books.google.com.tr/books?id=dgaWPc1NYnIC&pg=PA69&lpg=PA69&cdq> (accessed 9 Nov 2013).
- Guzel H, Oskay K, Cetin D, Beyazyildiz E, Kahveci K & Guvence N (2013) Attitude and approach of people who live in Southeastern Anatolia region on tissue and organ transplantation. *Transplantation Proceedings* 45, 869–871.
- Hair JF, Anderson RE, Tatham RL & Black WC (1998) *Multivariate Data Analysis*, 5th edn. Prentice-Hall, Upper Saddle River, New Jersey, pp. 87–138.
- Hilton A & Skrutkowski M (2002) Translating instruments into other language: development and testing processes. *Cancer Nursing* 25, 1–7.
- IRODaT (The International Registry of Organ Donation and Transplantation) Newsletter (2013) Worldwide donation activity. Available at: www.irodat.org (accessed 3 January 2015).
- Kaca G, Amado S, Kikici I, Cilasin S, Dag E, Leylek I & Sahin O (2009) Analysis on the basis of the theory of planned behavior of attitudes toward organ donation. *Turkish Journal of Psychology* 24, 78–91.
- Kapuagasi A, Sur HY, Ilhan O, Ozbaran M, Akoglu M & Eldegez U (2011) Organ transplantation and bone marrow. In *Health Services Requiring Specific Planning in Turkey 2011–2023*, Ministry of Health Treatment Directorate General. (Akdag R ed). Ministry of Health of Turkey, Ankara.
- Kent B & Owens RG (1995) Conflicting attitudes to corneal and organ donation: a study of nurses' attitudes to organ donation. *International Journal of Nursing Studies* 32, 484–492.
- Kilic S, Kocak N, Turker T, Gurpinar H & Gulerik D (2010) Attitudes of female university students about organ donation and factors affecting these attitudes. *Gulhane Medical Journal* 52, 36–40.
- Kocak Suren O (2007) Organ ve doku naklinin yasal ve etik acidan incelenmesi (Analysis legal and ethical of organ and tissue transplantation). *Turkiye Barolar Birligi Dergisi* 73, 174–195.
- Manyalich M, Costa AN & Parez G (2009a) 2008 international donation and transplantation activity. *Organs Tissues Cells* 12, 85–88.
- Manyalich M, Parez G & Costa AN (2009b) 2008 international donation and transplantation activity. *Organs Tissues Cells* 12, 161–164.
- Nunnally J & Bernstein I (1994) *Psychometric theory*, 3rd edn. McGraw-Hill, New York, p. 1994.
- Osborne JW & Costello AB (2004) Sample size and subject to item ratio in principle components analysis. *Practical Assessment, Research and Evaluation* 9, 8.
- Ozden E, Yakupoglu YK, Bostanci Y, Atac F, Karatas A & Sarikaya S (2010) Results of retroperitoneoscopic donor nephrectomy at our center. *Turkish Nephrology, Dialysis and Transplantation Journal* 19, 180–185.
- Parisi N & Katz I (1986) Attitudes towards posthumous organ donation and commitment to donate. *Health Psychology* 5, 565–580.
- Prieto AJ (1992) A method for translation of instruments to other languages. *Adult Education Quarterly* 43, 1–14.
- Tabachnick BG & Fidell LS (2001) *Using Multivariate Statistics*, 4th edn. Allyn and Bacon, Boston, pp. 25–26.
- Turkmen K, Erdur FM, Erikoglu M, Gai-pov A, Colak B, Tekin A, Yeksan M, Selcuk NY, Turk S, Tavli S & Tonbul HZ (2013) Renal transplant results of the organ transplant center of Meram Medical School between 2003–2011. *Turkish Nephrology, Dialysis and Transplantation Journal* 22, 34–44.
- Turkyilmaz S, Topbas M, Ulusoy S, Kal-yoncu M, Kilic E & Can G (2013) Attitudes and behavior regarding organ donation and transplantation on the part of religious officials in the Eastern Black Sea Region of Turkey. *Transplantation Proceedings* 45, 864–868.
- Uskun E & Ozturk M (2013) Attitudes of Islamic religious officials toward organ transplant and donation. *Clinical Transplantation* 27, E37–E41. doi:10.1111/ctr.12058.
- Yakupoglu YK, Ozden E, Kocak B, Dilek M, Akpolat T, Arik N, Cengiz K, Adibelli Z, Ozkaya O, Durupinar B, Eren Tulek N, Danaci M, Ceylan L, & Sarikaya S (2009) Three years of kidney transplantation experience at a university hospital. *Turkish Nephrology, Dialysis and Transplantation Journal* 18, 76–81.
- Yuksel H, Cinar Y, Sahin M, Ozer Z, Evreoz Y, Sener T & Cingu AK (2014) The effects of epidemiological characteristics of cornea donors and donor corneal evaluation parameters on quality of donor cornea. *Dicle Medical Journal* 41, 341–346.