Determinants of Medical Students for Intention to Organ Donation: Application of Theory of Planned Behavior

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ABSTRACT. Organ donation and transplantation save thousands of lives in the world. The aim of this study was identifying determinants of organ donation intention based on the Theory of Planned Behavior (TPB) among Iranian Medical Students. This cross-sectional study was performed during 2017 in Shahid Beheshti University of Medical Sciences. A sample of 438 students of Shahid Beheshti University of Medical Sciences was selected using multi-stage sampling method including stratified and random sampling. Data were collected by using a reliable and valid TPB-based questionnaire. All the participants filled the questionnaires and the data were extracted according to the previously described method. Data were analyzed by using the Statistical Package for the Social Sciences version 16.0 software. Descriptive statistic and Spearman correlation and Logistic regression were used for analyzing the data. Mean age of the participants was 20.92 ± 1.98 years. There was a significant linear positive correlation between behavioral intention and attitude, subjective norms, and perceived behavior control. Logistic regression analysis for assessing relation of TPB variables with behavioral intention showed that perceived behavioral control was more correlate with students’ intention for getting organ donation card (odds ratio: 1.049, confidence interval: 1.062, P <0.000) perceived behavioral control, explain student’s willingness to register as an organ donor. We must provide facilities so that students could register for organ donation easily.

Introduction

Organ donation and transplantation save thousands of lives in the world.¹² Clearly, one of the most important challenges for the healthcare system in Iran and other countries are the death of thousands of people who need to get an organ.³ Based on 2009 statistics in Germany, the rate of organ donation was 15.9 per million population (pmp) compared to 21.9 pmp in the United States or 34.4 pmp in Spain.⁴

The participants of this study were medical students for the reason that these people are the first to face a brain death case in the hospital and based on prior studies, they lack knowledge and proper awareness toward brain
death and the way to inform the family of the cases.\textsuperscript{2,3} They have an important role to improve rate of organ donation. As future staff, medical students have to take the role of promoting organ donations.\textsuperscript{4} Increase in organ donation of a country depends on the improvement in awareness and mindset of its medical science activists toward organ donation and the way they react to a case when it happens and the way they communicate with the brain death families.\textsuperscript{5}

According to the results of the study by Feeley, although most Americans have a positive attitude toward organ donation, donated behavior among American people was undesirable.\textsuperscript{6} Overall, there have been studies in Muslims country of Saudi Arabia, 66% of the studied population were be familiar with organ donation\textsuperscript{7} and 37.8% of the Qatari population were willing to donate their organs.\textsuperscript{8}

Theatrical model

Theory of planned behavior (TPB) has been established in social and health behavior studies by Ajzen and Fishbein.\textsuperscript{9} TPB is often used to study health-related decision-making behavior in adult.\textsuperscript{10} This theory suggests that intention is directly driven by attitude (positive or negative evaluations), subjective norms (the degree of perceived social pressure from significant others to do the behavior), perceived behavioral control and intention.\textsuperscript{11} According to this theory, behavior is the best predicted by intention. Intention is, in turn, determined by attitude toward the behavior, subjective norms, and perceived behavioral control.\textsuperscript{12}

TPB has used in some organ donation-related studies. Designing and planning interventions are the first step for increase the acceptance of organ donation, it is necessary to determine the influencing factors on organ donation. There is not any TPB-based study in our region that measured intention toward organ donation and transplantation. The aim of our study was identifying determinants of organ donation intention based on TPB among Iranian Medical Sciences students in Shahid Beheshti University of Medical Sciences (SBMU).

Methods

This was a cross-sectional study being performed in health, medicine, nursing, and midwifery faculties from December 2016 to February 2017.

Four hundred and thirty-eight students of SBMU were selected using multi-stage sampling method. According to the students’ number of each school, sample size in every school was calculated and then by using random sampling method. The participants were selected in each school. Students who had donor card and unwillingness to participate in this study were excluded.

The Student Research Committee in SBMU approved the study protocol. The ethics code was IR.SBMU.PHNS.1395.92. All the participants gave their informed consents and confidentially before inclusion in the study.

Data were collected using a questionnaire being designed according to the TPB. The validity of the questionnaire was evaluated by experts’ viewpoints. Seven health educators and promoters, two epidemiologists, three organ donation experts were selected by convenience sampling. The face and content validity of the questionnaire was measured.

Then, the Content Validity Ratio (CVR) was calculated. To determine the cutoff point for CVR, Lawshe’s table was used.\textsuperscript{13} Content validity index (CVI) (CVR) was used based on Waltz and Basel CVI.\textsuperscript{14} The CVI and CVR for each item were calculated (CVR: 0.93 and CVI: 0.90). The reliability of the questionnaire was evaluated (Cronbach’s alpha: 0.893 and ICC: 0.93).

The questionnaire included demographic characteristics gender, age, ethnicity, occupation, religion etc, (26 questions), attitude (14 questions), subjective norms (16 questions), perceived behavioral control (10 questions), and intention is determined by two questions.

Attitude, subjective norms, perceived behavior control, and intention questions were developed on the basis of five-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree), so scores were between 1 and 5.
Two behavior questions were developed as two answer choices (yes, no) that one and zero score were used for yes and no response, respectively. Thus, the total score was calculated based on the percentage of each option question.

The questionnaires were distributed to four hundred and fifty students during break time of their classes. Investigator gave appropriate instructions about the study. Then, the questionnaires were completed without name and were collected by investigator.

All the information was entered into a computer database. Data were analyzed by the Statistical Package for the Social Sciences version 16 Software (SPSS Inc., Chicago, IL, USA). Data were reported as a mean ± standard deviation and proportions as appropriate. Spearman correlation test was used for assessing the linear correlation between the corresponding variables and the correlation coefficients were calculated. For all statistical tests, the alpha level for all statistical tests was $P < 0.05$.

**Results**

Thirteen questionnaires did not suitable and unfilled for the analysis and questionnaires of 438 medical students were analyzed. Of the respondents, 40.6% were male and 59.4% was female. The respondents had a mean age of 22.30 ± 4.761 years (18–49 years). All of the students were Muslim and 94.3% were Shia. We showed result of demographic variables in Table 1.

Participants announced their families 65.8%, friends 30.6%, doctors and medical staff 29.5%, religious leaders 22.8%, and teachers 18.5% as the most influential people in their decision-making for getting organ donation card.

According to Table 2, There was significant linear positive correlation between behavior intention and attitude ($r = 0.103; P < 0.031$), subjective norms ($r = 0.152; P < 0.001$) and perceived behavior intention ($r = 0. 394; P <0.000$) (Table 2).

Table 3 shows that there was significant linear positive correlation between behavior intention and behavior beliefs ($r = 0.2; P <0.000$) and normative beliefs ($r = 0.238; P <0.000$) and control beliefs ($r = 0.301; P <0.000$) and perceived power ($r = 0.412; P <0.000$).

In the same way, we did not find any significant linear correlation between behavior intention and outcome evaluations ($r = −0.014; P = 0.777$) and motivation to comply ($r = 0.063; P = 0.187$).

In same way, application of the logistic regression analysis and backward stepwise method was used to assess the relation of TPB variables on behavioral intention. Attitude toward organ donation used with odds ratio estimate of 0.996 (95% confidence interval: 0.986, 1.006), no influential predictor of organ donation intention. According to Table 3, regression analysis of the variables indicated that subjective norms and perceived behavioral control can be used as predictors of behavioral intention, between them perceived behavioral control was influential.

**Discussion**

Based on the TPB, this study investigated how attitude, social norms, and perceived behavioral control influenced in the behavioral intention to register as an organ donor for medical students in SBMU.

According to the results, attitude is not predictive for organ donation among participants. Bresnahan et al.\(^\text{15}\) investigated attitude toward organ donation was the highest predictors of organ donation for those in the United States, Japan, and Korea.

As the same way, the result of Hyde et al.\(^\text{16}\) showed that attitude as a significant predictor of intentions to register for organ donation, same another research (Morgan,\(^\text{17}\) Smith et al.\(^\text{18}\) and Park and Smith,\(^\text{13}\)) they also announced attitude as a strong predictor in these participants. Wu\(^\text{14}\) found that attitude was not a significant predictor of talking with family. Discuss with family can promote the understanding of family member’s donation decisions, and must prepare effective facilitate
such as education and use social networks and promote family discussion.\textsuperscript{19,20}

Because of contradictory, this finding with previous studies might be high mean score of attitude among participants about organ donation.

In addition, this study showed that Subjective norms predicted intention to become a donor among medical students. The findings of current study are consistent with those of Hyde

Table 1. Frequency of demographic variables (438 students of Shahid Beheshti University of Medical Sciences).

| Variable          | Characteristics | n (%)          |
|-------------------|-----------------|----------------|
| Living place      | Urban area      | 411 (93.8)     |
|                   | Rural area      | 26 (5.9)       |
| Gender            | Female          | 260 (59.4)     |
|                   | Male            | 178 (40.6)     |
| Degree of education | BS             | 238 (54.3)     |
|                   | MSc             | 68 (15.5)      |
|                   | PhD             | 30 (6.8)       |
|                   | GP              | 102 (23.3)     |
| Mother’s education | Primary school | 95 (21.7)      |
|                   | Guidance school | 53 (12.1)      |
|                   | Diploma         | 144 (32.9)     |
|                   | Academic education | 144 (32.9) |
|                   | Other           | 2 (0.5)        |
| Father’s education | Primary school | 58 (13.2)      |
|                   | Guidance school | 51 (11.6)      |
|                   | Diploma         | 133 (30.4)     |
|                   | Academic education | 195 (44.5) |
|                   | Other           | 1 (0.2)        |
| Father’s job      | Unemployment    | 16 (3.7)       |
|                   | Freelance       | 2 (0.5)        |
|                   | Worker          | 10 (2.3)       |
|                   | Employee        | 170 (38.9)     |
|                   | Other           | 75 (17.2)      |
| Mother’s job      | House wives     | 325 (74.2)     |
|                   | Freelance       | 2 (0.5)        |
|                   | Employee        | 67 (15.3)      |
|                   | Other           | 44 (10.1)      |
| Marital status    | Single          | 391 (89.3)     |
|                   | Married         | 45 (10.3)      |
|                   | Others          | 2 (0.5)        |

Table 2. Bivariate correlation among constructs of theory of planned behavior related to organ donation registration.

| Variables          | Behavioral intention | Attitude | Subjective norms | Perceived behavioral intention |
|--------------------|-----------------------|----------|------------------|--------------------------------|
| Behavioral intention | 1                    | -        | -                | -                              |
| Attitude           | 0.103                 | 0.031    | -                | -                              |
| Subjective norms   | 0.152                 | 0.001    | 0.170            | 0.000                          |
| Perceived behavioral intention | 0.394                 | 0.268    | 0.033            | 0.490                          |

\( P < 0.05 \).
et al. who found that subjective norms as significant predictors for intention to become an organ donor. According to Alvaro et al., having family discussion was significant predictors for organ donation and willing to be an organ donor was predictive of family discussion.

In this study, family has the most important influence for participant decision-making. More than 65% participants announced family as the most influential people in their decision for getting organ donation card. In general, in Iran the consent of family is required by law to enable the actual organ donation, we could inform family about organ donation and improve their knowledge about this. Among studies, some of them announced that people willing to talk with family were more willing to became potential organ donation.15,18

Our results support the conclusion that the perceived behavior control as the most important predictor for intention to organ donation, according to this result only provide a facilities so that students could register for donor card and can significantly increase positively influence attitude to organ donation among students. Moreover, other results showed that knowledge and attitude do not make behavior change alone, but the most important factors in this study for changing behavior were providing facilities and families and friend’s opinion about organ donation.

This study has several strengths including the use of large sample size, a strong theoretical framework using standardized measures. The limitation of this study which is needed to be taken into consideration when making generalizations about the findings. One of them is unwilling some students for participate because they never thought about organ donation and some schools did not allow us to do this study at their schools. Totally, health promoters must be able to manage more effective interventions for promoting several behaviors.22

Moreover, the results lead us to the conclusion that, perceived Behavior control affect participants’ donation decision making and appear to impact on their decisions. To facilitate decision-making it is needed to prepare tools and equipment to get the organ donation card at the schools. Also, we need to prepare families with organ donation awareness due to their influencing on approve or disapprove donation of their members and perception of the decision-making process. The result of this study has important implications for the further community based education program for encouraging student to register as organ donors.

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**Conflict of Interests:** None declared.

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| Predictive factor          | B     | SE    | OR    | 0.95% CI for EXP Lower | Higher | P   |
|---------------------------|-------|-------|-------|------------------------|--------|-----|
| Attitude                  | −0.004| 0.005 | 0.996 | 0.986                  | 1.006  | 0.467|
| Subjective norms          | 0.016 | 0.005 | 1.016 | 1.006                  | 1.026  | 0.002*|
| Perceived behavioral control | 0.048 | 0.006 | 1.049 | 1.036                  | 1.062  | 0.000*|

CI: Confidence interval, SE: Standard error, OR: Odds ratio.

*P <0.05.
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