**TRC JOURNAL OF MEDICINE**
http://dx.doi.org/10.55280/trcjm.2024.2.1.0002

**RESEARCH ARTICLE**

# The Behavioural Characteristics of First-Time Blood Donors in Türkiye: An Extensive Analysis of the Theory of Planned Behavior Model

**Nazlı Nadire Sözmen[a], Mustafa Ulukanlıgil[a], Şükrü Çağlak[a], Sıdıka Selin Çöplen[a], Kerem Kınık[b], Fatma Meriç Yılmaz[c]**

[a] Directorate of Medical Management, General Directorate of Blood Services, Turkish Red Crescent, Ankara, Türkiye.
[b] University of Health Sciences, Department of Emergency Aid and Disaster Management, Istanbul, Türkiye.
[c] Managing Board, Turkish Red Crescent, Ankara, Türkiye.

**ABSTRACT**

TRC has a large blood donor pool and collects more than 2.5 million donations annually, despite a large proportion of the Turkish population only donating blood once. Understanding donor behavior and the factors that motivate people to donate again after their first donation is important for improving donor retention. First-time donors ($N$ = 1,478) participated in a face-to-face survey assessing standard theory of planned behavior (TPB) constructs. The study also includes the factors of self-identity, anticipated regret, donation anxiety, paraphernalia anxiety, personal moral norm, descriptive norm, satisfaction, and motivation. The majority of participants are: male (76.8%), between 18-65 years old, married (68.1%), with a high school diploma (41.3%), attending university (28.8%), currently working (45.3%), and paid minimum wage (44%). The TPB constructs were significantly correlated with intention ($p < 0.001$). The final extended TPB model provides an excellent fit to the data ($C_{min}$ / $df$ = 3.112, CFI = 0.951, $RMSEA$ = 0.038). Overall, the final model accounts for 75.3% of the variance in intention. The results of this study provide important data from the perspective of donor retention.

**ARTICLE HISTORY**
Received March 1, 2024
Revised June 7, 2024
Accepted August 23, 2024

**KEYWORDS**
theory of planned behavior • blood donation • blood donors • recruiting donors • retaining donors

Türkiye had lacked a standardized, centralized blood banking system, and this created problems for the health system. The Turkish Red Crescent (TRC) started the National Safe Blood Supply Project in 2005 to establish a a new monopolized, centralized blood banking system in Türkiye in line with international standards and technologies (Ulger et al., 2019).

By the end of the first year of the project, the TRC had collected 20% of the blood needed in the country (i.e., 1,500,000 units; Ulger et al., 2019). By the end of 2017, the TRC had supplied 82% of the blood needed in Türkiye (i.e., 2,391,487 units; Ulger et al., 2019; TRC General Directorate of Blood Services, 2017). The main focus of the TRC has been on setting targets and recruiting blood donors to meet the country's blood needs as set by the Ministry of Health.

Between 2009-2017, 7,338,696 people gave blood. However, when considering the frequency with which donors donated during this time, 51.8% of donors donated only once in those 8 years (Ulger et al., 2019; TRC General Directorate of Blood Services, 2017). The percentages of donors who donated two, three, four , five, or six times over the 8 years are 17.4%, 8.2%, 4.5%, 2.8%, and 1.8%, respectively. The percentage of donors who donated 16 times in 8 years (an average of twice a year) is 0.14%, while the number of donors who donated 24 times in 8 years (three times a year on average) is 0.005% (Ulger et al., 2019; TRC General Directorate of Blood Services, 2017).

These results indicate that first-time donors make up a large percentage of the TRC donor pool. However, the vast majority of these first-time donors do not donate

**CORRESPONDENCE TO:** Nazlı Nadire Sözmen, The Turkish Red Crescent General Directorate of Blood Services, Ankara Türkiye. Email: nazli.sozmen@kizilay.org.tr
ORCID: 0000-0002-7783-0366

**To cite this article:** Sözmen, N. N., Ulukanlıgil, M., Çağlak, Ş., Çöplen, S. S., Kınık, K., & Yılmaz, F. M. (2024). The Behavioural Characteristics of First-Time Blood Donors in Türkiye: An Extensive Analysis of the Theory of Planned Behavior Model. *TRC Journal of Medicine, 2,* 11–24. http://dx.doi.org/10.55280/trcjm.2024.2.0002

again. Similar to many other blood collection organizations (Masser et al., 2012), the TRC clearly has poor retention of first-time donors. Therefore, the need exists to understand the behaviors of blood donors and the factors that motivate them to donate again after their first donation in order to improve blood donor retention. Unfortunately, only a few studies have been conducted on the behaviors of first-time donors. Miller and Weikel (1974) noted that retaining existing donors is operationally more efficient than constantly recruiting new donors. Wallace and Pegels (1974) estimated a large enough pool of past donors existed for meet the needs of the ANT area 5-10 times over, if only these past donors could be motivated to return. Moreover, such a group would probably be much more reliable than an ever-changing population of individuals who donate once or twice and then never return (Callero & Piliavin, 1983; Wallace & Pegels, 1974). A consensus seems to be emerging on how to solve the immediate problems of blood shortage and unpredictability of supply regarding the factors that encourage people to start donating and the factors that prevent those donors from returning to donate (Bagot et al., 2016; van Dongen, 2015). Regular donors make a large number of donations over their lifetime, negating the current significant need to constantly recruit new donors (Callero & Piliavin, 1983).

The theory of planned behavior (TPB) is the dominant behavioral decision model used to understand blood donation behaviors (Bagot et al., 2016; Ferguson, 1996). According to TPB (Ajzen, 1991), the key determinant of behavior is an individual's intention to perform that behavior. In turn, an individual's intention to perform a behavior is influenced by their attitude toward performing that behavior, their subjective norm, and their perceived behavioral control over the behavior (Ajzen, 1991). Attitude refers to the individual's positive or negative evaluation of performing the behavior. Subjective norm refers to the degree of perceived social pressure to perform the behavior. Perceived behavioral control refers to the perceived ease or difficulty of control over performing the behavior. Many studies have chosen self-efficacy to reflect perceived behavioral control, which has been shown to be a stronger predictor of intention than perceived controllability (Armitage & Conner, 2001b; Giles & Cairns, 1995; Giles et al., 1995). Bandura (1997) defined self-efficacy as an individual's confidence in their ability to perform a behavior. Self-efficacy has been assessed in a number of studies using the TPB model in relation to blood donation (Armitage & Conner, 2001a; Giles & Cairns, 1995; Giles et al., 1995; Lemmens et al., 2005). These studies show that self-efficacy is a more consistent, significant predictor of intention to donate blood than perceived behavioral control (Armitage & Conner, 2001b; France et al., 2007; Giles & Cairns, 1995; Giles et al., 1995).

Self-identity, also referred to as role-identity refers to the extent to which individuals perceive that being a blood donor is an important part of their self-conceptualization. While Pilivian (1990) proposed that an experienced blood donor may increasingly internalize a blood donor identity by repeating the behavior, few studies have examined the impact of self-identity on intention to donate blood in samples of donors and non-donors (Armigate, 2001; Giles et al., 1995; McMahon & Byrne, 2008). Personal moral norm refers to a sense of moral obligation or responsibility to donate blood (Ajzen, 1991; France et al., 2007). Ajzen (1991) noted that moral obligations are expected to influence intentions in parallel with attitudes, subjective norms, and perceptions of behavioral control. In the context of blood donation, France et al. (2007) used a revision of the TPB model to show that the path between personal moral norm and intention do not have good fit and that a path should exist between personal moral norm and intention for a better fit. However, a few studies (Amponsah-Afuwape et al., 2002; Godin et al., 2005; Lemmens et al., 2005; Masser et al., 2008) have shown personal moral norm to be a significant predictor of blood donation intention. Furthermore, Masser et al.'s (2009) study on donors showed an indirect relationship between moral norm and intention through attitude. Compared to moral and subjective norms, descriptive norms involve a consideration of what significant others actually do (Rivis & Sheeran, 2003). The results from Robinson et al.'s (2008) study indicate descriptive norms to have a direct significant path to intention for non-donors. They also suggested emphasizing the role of descriptive rather than subjective norms to perhaps be useful for first-time donors (Robinson et al., 2008). A number of studies found negative affective reactions such as anticipated regret (Godin et al., 2005; Godin et al., 2007) and anxiety (Ajzen, 1991; Giles & Cairns, 1995) to influence the decision making of both new and experienced blood donors (Ditto & France, 2006; France et al., 2007; France et al., 2004). Anticipated regret refers to the anticipation of feeling regret for not donating blood in the future (Godin et al., 2005, 2007; Masser et al., 2009). Godin et al. (2007) were the first to examine anticipated regret in the context of blood donation and found anticipated regret to be a more important determinant of intention to donate for new donors than for experienced donors. Masser et al. (2009) investigated anticipated regret to understand blood donors' motivation to donate again in the future. They found that anticipated regret was a direct predictor of intention.

Some studies (Clowes & Masser, 2012; France et al., 2010; France et al., 2011) have assessed anxiety about donating blood in relation to exposure to blood, needles or pain as an additional determinant of decision making. Loewnstein (2005) mentioned the effect of the hot state on anxiety, while France et al. (2011) showed no difference to exist for various states, including the various ways anxiety intervenes in the intention to donate blood. Nevertheless, Clowes and Masser (2012) showed the paraphernalia associated with blood donation to cause anxiety in potential donors. France et al. (2007) assessed satisfaction as a potential construct for repeat donation, with their analysis finding satisfaction to be an indirect predictor of intention to donate by means of attitude. Previous studies have not yet evaluated motivation on its own as a determinant of blood donation. Motivation is a factor in decision making that should not be ignored and is related to external factors that induce an individual to donate blood and support them in this.

**Aim of the Study**

This study focuses specifically on donor retention by examining a number of factors that may contribute to first-time donors' intentions to donate blood. Specifically, we use structural equation modelling to examine the relationships between the extended TPB variables in the literature and the additional variables based on our observations and donors' intentions. The proposed model includes the TPB-based constructs of attitude, self-efficacy, and intention. We also examine the relationship that self-identity, anticipated regret, donation anxiety, paraphernalia anxiety, personal moral norm, descriptive norm, satisfaction, and motivation have on intention to donate (Figure 1). Giles and Cairns (1995) suggested self-efficacy to be a more useful predictor than perceived behavioral control in the context of blood donation, so we use self-efficacy as a construct instead of perceived behavioral control. In line with the findings of Masser et al. (2009), who extended France et al.'s (2007) model, we predict the effects of donation anxiety, paraphernalia anxiety, self-identity, satisfaction, motivation and personal moral norm on intention to be mediated through their effects on attitude. Clowes and Masser (2012) demonstrated the effect of paraphernalia on donor intention in their study conducted in affectively hot and cold settings. Therefore, we have assessed anxiety as a construct through two different items by taking advantage of the hot setting of this study, which was conducted immediately after the donor had given blood. We predict that this situation will allow us to assess the effect of paraphernalia anxiety on first-time donors' intentions separately from a more general anxiety about donation.


*Figure 1.* The proposed model.

Lastly, we included a number of other variables that might influence intention, such as age, gender, education level, income level, employment status, and marital status.

## Materials and Methods

### Study Design

Ethical approval for this study was granted by the TRC Ethics Committee. Participation was voluntary, with informed consent being obtained from all individual participants included in the study. The respondents completed the questionnaire and were accompanied by volunteer graduate student interviewers. The TRC regional blood centers provided all the basic daily needs of the volunteer graduate students. All interviewers had certificates indicating that they were volunteers working for the TRC. The interviewers collected data in accordance with the prepared questionnaire through face-to-face interviews by interacting directly with the blood donors who volunteered to participate in the survey after donating in the mobile blood collection teams or at the blood collection centers. Two types of questionnaires were designed: one for experienced donors and one for first-time donors. For the purposes of this study, it will only evaluate and analyze the results from first-time donors, with the results from experienced donors being discussed in the future.

The survey was validated over a subset of participants ($n$ = 36) who had participated in a pilot test prior to the fieldwork period (July 16-August 19, 2018). The data the interviewers collected were checked at random, and the number of surveys per day per blood collection site/mobile team was limited to ensure a homogeneous distribution of data.

### Participants

A total of 1,570 first-time blood donors in the 18 regional blood centers and 34 blood collection centers over 29 cities across Türkiye were approached to participate in the study. Of these, 92 donors failed to complete the survey, so responses were obtained from 1,478 participants (343 women and 1,135 men). These donors were between 18-65 years old, with most being married (68.1%), having completed high school (41.3%), and attending university (28.8%). Of the participants, 45.3% currently work, 7% have a high income (> 5,000 Turkish Liras per month [TL]), 22% have a medium income (2,500-5,000 TL per month), 27% have a lower income (1,700-2,500 TL per month), and 44% have a minimum income (< 1,700 TL).

### Measures

The questionnaire includes items designed according to the standard TPB predictors of attitude, self-efficacy, and intention (Ajzen 1997). One of the standard predictors (i.e., subjective norm) was not included in the proposed model because the participants in this study had never had the experience of donating blood before and, according to our hypothesis, no behavioral reflection on their social environment was present. They did not have the opportunity to observe and evaluate the views of people who are important to them regarding their first blood donation experience. Analyzing the effect of subjective norm immediately after their first blood donation would have been insufficient. This is why the model does not include subjective norm. In the context of blood donation, specifically to examine how first-time donors progress from novice donors to established repeat donors, a number of additional constructs were included to improve the predictive power of the model. The extensions to the TPB include the addition of moral norm, anticipated regret, satisfaction, donation anxiety, paraphernalia anxiety, self-identity, descriptive norm, and motivation. The measures of traditional TPB are based on Ajzen's model (1997), and the measures of the additional predictors have been derived from other extended TPB blood donation studies alongside our own observations. The 6-month time frame was chosen within intention because most donors in Türkiye donate twice a year, as described in the introduction (Ulger et al., 2019, TRC General Directorate of Blood Services, 2017). All other predictors assessed in the survey are shown in Appendix 1.

### Statistical Analysis

An initial examination of the data was used to confirm the expected associations between the predictors and intention to donate blood. Descriptive data were analysed using analysis of variance (ANOVA). Multiple linear regression analyses were performed to evaluate the distribution of the predictors. In the second stage, according to the obtained distribution values, a series of goodness-of-fit indices were calculated and examined for each of the tested models; specifically, Chi-square as minimum discrepancy per degree of freedom (Cmin/Df), goodness-of-fit index (GFI), comparative fit index (CFI), root mean squared error approximation (RMSEA). The basic TPB model was compared with the model derived from the results of France, France and Himawan (2007) and then with the model of Masser and colleagues (2009). The comparison was made by adapting the model of France and colleagues (2007) by setting the paths between

donation anxiety, paraphernalia anxiety, self-identity, motivation, Donor Reaction Inventory and attitude to 0, as well as the paths between anticipated regret, personal moral norm, descriptive norm, subjective norm and intention to 0. For the comparison of the model of Masser and colleagues (2009), the paths between motivation, satisfaction, paraphernalia anxiety and attitude and between descriptive norm and intention were set to 0.

Statistical analyses were performed using IBM SPSS Amos version 24.0 software, followed by structural equation modeling using IBM SPSS Amos version 23.0 software.

## Results

### Descriptive Analyses of the Demographic Variables

Analysis of variance (ANOVA) was used to analyze the participants' descriptive data, as shown in Table 1.

**Table 1**

*The Effect of Descriptive Data on Blood Donation Intention Over the Next 6 Months and Attitude*

| Demographic variables | *n* | % | Effect on intention | Effect on attitude |
|---|---|---|---|---|
| | | | Sig. | Sig. |
| ***Sex*** | 1,478 | | 0.346 | 0.014* |
| Male | 1,135 | 76.79 | | |
| Female | 3,43 | 23.21 | | |
| ***Age*** | 1,467 | | 0.0169* | 0.369 |
| 35-44 | 192 | 13.09 | | |
| 18-24 | 830 | 56.58 | | |
| 25-34 | 333 | 22.70 | | |
| 55-65 | 23 | 1.57 | | |
| 45-54 | 89 | 6.07 | | |
| ***Education status*** | 1,478 | | 0.001* | 0.02* |
| Postgraduate | 44 | 2.98 | | |
| High school | 611 | 41.34 | | |
| Primary School | 161 | 10.89 | | |
| Junior High School | 236 | 15.97 | | |
| University | 426 | 28.82 | | |
| ***Employee status*** | 1,473 | | 0.064 | 0.001* |
| Unemployed | 670 | 45.49 | | |
| Employed | 803 | 54.51 | | |
| ***Level of income*** | 1,144 | | 0.033* | 0.066 |
| Minimum-income | 499 | 43.62 | | |
| Lower-income | 314 | 27.45 | | |
| High-income | 76 | 6.64 | | |
| Middle-income | 255 | 22.29 | | |
| ***Marital status*** | 1,467 | | 0.881 | 0.569 |
| Married | 460 | 31.36 | | |
| Single | 1,007 | 68.64 | | |

* $p < 0.05$.

Gender was not significantly associated with intention to donate blood in the next 6 months. However, gender was significantly associated with attitude. Female first-time donors had a more positive attitude toward blood donation. Age group showed a significant relationship with intention. First time donors aged 35-44 years showed a higher intention to donate blood in the next 6 months, followed in order by the age groups 18-24, 25-34, 55-65, and 45-54 years. Education level was also significantly associated with intention, where first-time donors with a postgraduate degree have a significantly higher intention to donate, followed respectively by donors with a high school, primary, and junior high school education. However, donors with a university degree showed the lowest intention. The demographic survey also showed income level to have a significant effect on blood donation intention, where donors with minimum wage have higher donation intention, followed by donors with low income, high income, and middle income. The survey also showed donor employment status to be significantly related to attitude, where unemployed donors interestingly have higher donation intention than employed donors.

### Correlation Analyses of Behavioral Predictors

The preliminary correlation analysis shows the predictors to be significantly correlated with intention (all $p$ values $< 0.001$). Personal moral norm has the strongest positive relationship with intention to donate blood within 6 months, followed by attitude, self-identity, motivation, anticipated regret, self-efficacy, and satisfaction (see Table 2). Donation anxiety, paraphernalia anxiety, and descriptive norm have a significant negative relationship with intention.

**Table 2.**

*Correlations Among TPB Predictors*

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **Intention** | 1 | 0.362† | 0.082† | 0.413† | -0,022 | -0.178† | 0.259† | -0.102† | 0.289† | 0.324† | 0.166† |
| **2** | **Attitude** | | 1 | 0.061* | 0.259† | -0.114† | -0.294† | 0.229† | -0.218† | 0.206† | 0.302† | 0.189† |
| **3** | **Satisfaction** | | | 1 | 0.195† | 0.032 | 0.02 | 0.032 | 0.071† | 0.243† | 0.139† | 0.093† |
| **4** | **Personal Moral Norm** | | | | 1 | 0.093† | -0.080† | 0.214† | -0,029 | 0.230† | 0.287† | 0.117† |
| **5** | **Descriptive Norm** | | | | | 1 | 0.138† | 0.056* | 0.107† | 0.048 | -0.057* | -0.076† |
| **6** | **Donation Anxiety** | | | | | | 1 | -0.095† | 0.337† | -0.140† | -0.201† | -0.226† |
| **7** | **Anticipated Regret** | | | | | | | 1 | -0.085† | 0.210† | 0.225† | 0.081† |
| **8** | **Paraphernalia anxiety** | | | | | | | | 1 | -0.091† | -0.244† | -0.157† |
| **9** | **Motivation** | | | | | | | | | 1 | 0.265† | 0.149† |
| **10** | **Self-identity** | | | | | | | | | | 1 | 0.255† |
| **11** | **Self-efficacy** | | | | | | | | | | | 1 |
| ***M*** | | 4.529 | 4.626 | 3.932 | 4.396 | 2.944 | 1.682 | 3.889 | 1.599 | 4.288 | 4.700 | 4.479 |
| ***SD*** | | 0.684 | 0.536 | 0.497 | 0.705 | 1.396 | 0.917 | 1.318 | 1.058 | 0.670 | 0.526 | 0.969 |

*$p < 0.05$ (two-tailed)

†$p < 0.001$ (two-tailed)

### Testing the Models

Table 3 shows the results from the goodness-of-fit tests for all the analyzed models. These results provide a significantly better fit to the data than the TPB model on its own. Also, Masser et al.'s (2009) model provides a better fit to the data than France et al.'s (2007). Furthermore, the results from the goodness-of-fit tests for the proposed model indicate the fit between the proposed model and data could be improved with further modifications by including paths among motivation, self-identity, and intention ($C_{min}$ / *df* = 14; CFI = 0.681; *RMSEA* = 0.094). Contrary to recent analyses suggesting the inclusion of paths between donation anxiety and attitude, the data were improved by including the opposite path between donation anxiety and intention.

**Table 3.**

*Goodness-of-Fit Results for Each Model*

| **Model** | **$C_{min}$ / *df* *** | **GFI †** | **CFI ‡** | ***RMSEA* §** |
|---|---|---|---|---|
| TBP | 354.97 | 0.481 | 0.136 | 0.49 |
| France et al. | 40.505 | 0.665 | 0.535 | 0.164 |
| Masser et al. | 29.785 | 0.678 | 0.576 | 0.14 |
| Proposed model | 14 | 0.732 | 0.681 | 0.094 |
| Revised model | 3.112 | 0.918 | 0.951 | 0.038 |

* $C_{min}$ / *df* = minimum discrepancy per degree of freedom. A value < 5 shows acceptable/good fit and < 3 desirable/perfect fit.

† GFI = goodness-of-fit index. Ranges from 0.00-1.00 with GFI > 0.90 being acceptable.

‡ CFI = comparative fit index. Ranges from 0.00-1.00, with CFI > 0.90 being acceptable.

§ *RMSEA* = root mean squared error approximation. Ranges from 0.00-1.00, with *RMSEA* < 0.06 being acceptable.

The goodness-of-fit tests show a good result for the revised model, with $C_{min}$ / *df* = 3.112, CFI = 0.951, and *RMSEA* = 0.038 being within acceptable ranges. The revised model (Figure 2) shows satisfaction to be the only indirect predictor of intention by means of attitude, with personal moral norm, attitude, self-identity, motivation, anticipated regret being direct positive predictors of intention. Donation anxiety is the only negative direct predictor of intention, while self-efficacy has an indirect effect on intention through self-identity and a negative effect on donation anxiety. Descriptive norm is the indirect predictor of intention by means of anticipated regret. Paraphernalia anxiety has a positive effect on donation anxiety. Overall, the revised model accounts for 75.3% of the explained variance in intention.

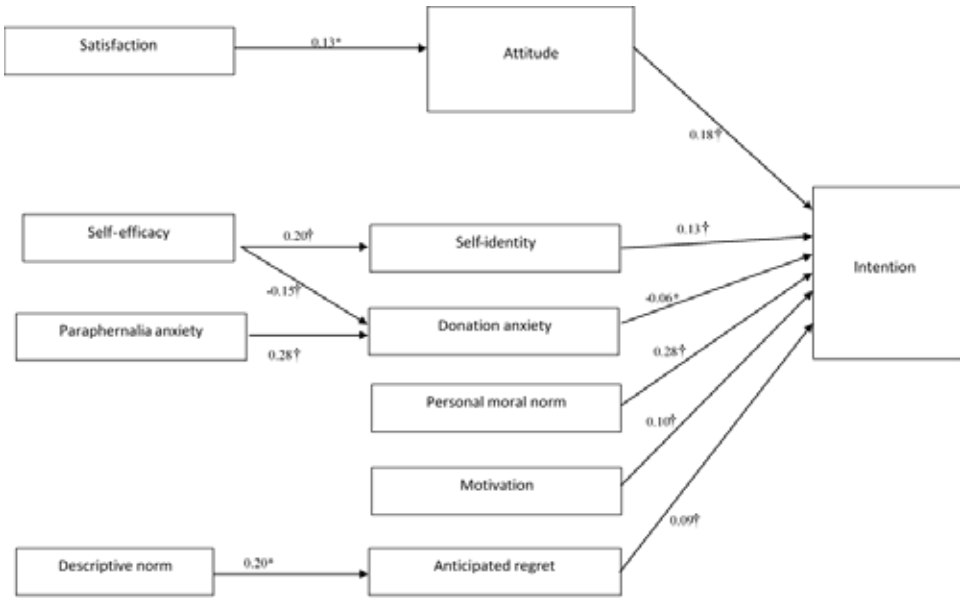


*Figure 2*. The final revised model with standardized path coefficients and regression weights for predictors.

* $p < 0.05$; † $p < 0.001$ (two-tailed)

## Discussion

The aim of this study has been to investigate the determinants of blood donation intention among Turkish first-time blood donors immediately after their first blood donation experience. Identifying and examining the determinants and analyzing their effects on blood donation intention are important for implementing new donor retention strategies. Also, we have aimed to identify the satisfaction of first-time donors (including experience, expectations, and service content) and to use planning strategies to evaluate how to get first time donors to become established repeat donors.

The demographic data reveal age range to have a significant relationship with intention, with first-time donors aged 34-45 having the strongest intention and the 45-54 age group having the weakest intention to donate blood in the next 6 months. This result suggests that young adults have a higher intention to donate blood. Several studies have shown intention to be strongly associated with donation behavior (Ajzen, 1991; France et al., 2007; Godin et al., 2007; Masser et al., 2008, 2009; Veldhuizen et al., 2011), so the number of donors per age group is comparable to intention by age group. Thus, this finding is consistent with other studies that have indicated the number of donors in the 35-44, 45-54, and 25-34 age groups to have high donation rates and the 18-25 age group to have the lowest donation rate (Veldhuizen et al., 2009; Godin et al., 2007). The data have also shown education level to be significantly related to intention, with first-time donors possessing a postgraduate degree having the highest intention to donate at a significant level, followed by donors with a high school, primary school, and junior high school education. Interestingly, first-time donors with a university degree showed the lowest intention. This finding is contrary to another study which indicated donors with a university degree to be more likely to donate than those with a primary school degree (Godin et al., 2007). This contradiction needs further evaluation as to why donors with lower education levels have higher levels of intention to donate among Turkish blood donors. The demographic data have also indicated income level to have a significant effect on intention to donate blood, where donors with the minimum income level have higher levels of intention to donate, followed by donors with low-, high-, and middle-income levels. This finding is also contrary to studies conducted in Western countries, where high income donor groups had higher donation rates than low- and middle-income donor groups (Godin et al., 2007; Veldhuizen et al., 2009). This may be because the minimum-income groups understand people's needs and may develop empathy for the sick. Minimum-income donors may also need to feel the satisfaction of doing something good by donating blood in order to build self-confidence and develop a warm glow that mediates the effects of altruistic behavior (Hartmann et al., 2009). However, this study includes a large number of participants whose demographic information is limited to first-time donors. This study also does not address all blood donors in Türkiye.

The results from this study allow the main predictors and characteristics of first-time blood donors to be identified, as well as the factors underlying the intention to donate again in the next 6 months. Building on the results of France et al.'s (2007) and Masser et al.'s (2009) studies, we used an extended TPB model to identify the main predictors and characteristics of Turkish first-time blood donors' intention to donate again in the next 6 months. The proposed model involves the direct effects of attitude, self-efficacy, anticipated regret, and descriptive norm on intention to donate, as well as the indirect effects through attitude of satisfaction, donation anxiety, paraphernalia anxiety, self-identity, motivation, and personal moral norm on intention to donate. We were able to examine the determining factors and their interrelationship in predicting donation intention by using the path analysis technique. Firstly, by comparing the fit of the TPB model with our proposed model, we showed that our proposed model fit the data better than the original model. By further comparing the fit of the proposed model against the models of France et al. (2007) and Masser et al. (2009), we were able to find a better fit to the data than the previous studies. However, while these analyses did reveal the proposed model to be superior to the original, France et al.'s (2007), and Masser et al.'s (2009) models, they still did not provide an optimal fit to the data. Further investigation also revealed self-efficacy to have not a direct but an indirect effect on intention by shaping self-identity. Furthermore, donation anxiety, which had previously been identified as having a direct effect on attitude, and paraphernalia anxiety had indirect effects on intention by shaping donation anxiety, as expected. Meanwhile, while motivation and personal moral norm were constructed as indirect factors, further analysis identified each as a direct predictor of intention. Lastly, descriptive norm had not a direct but an indirect effect on intention by means of anticipated regret.

The current findings extend the existing literature in several ways. Firstly, this study only shows the relationships regarding first-time donors. Secondly, this survey was conducted in a hot environment and took place immediately with face-to-face interviews right after the participants' first experience donating blood. This is in comparison to other

studies whose populations consisted of telephone conversations or e-mail communications in a cold environment. A hot environment may be an advantage in terms of the donors' true perceptions when feelings are so fresh. Thirdly, this study describes additional factors for both attitude and intention. The study evaluated motivation and satisfaction as new predictors, and these results show motivation to have a direct effect on intention, whereas satisfaction has an indirect effect on intention through attitude. The study also evaluated anxiety through two different subcategories (i.e., donation anxiety and paraphernalia anxiety). As such, the results show paraphernalia anxiety to promote donation anxiety, and this had a direct negative effect on intention to donate. This study has shown self-identity to be a significant direct predictor of intention for more than just experienced donors. Lastly, this study has established the pathways among all these interrelated factors.

The results from this study show personal moral norm to be the strongest determinant of first-time donors' intention to donate again and attitude to be the second strongest positive determinant. Meanwhile, Godin et al. (2007) found moral norm to be a significant determinant in predicting intention not for new blood donors but only for experienced donors. Godin et al. suggested that moral norm could be constructed after a repeated experience of donating blood, which means that moral norm plays a role in maintaining blood donation behavior more than it contributes to initiating the behavior. In contrast, Veldhuizen et al. (2011) found moral norm to be an important predictor of intention for all donors, regardless of their level of experience donating blood.

Donation anxiety emerged as a negative direct predictor of intention according to the goodness of fit test, as expected. Furthermore, paraphernal anxiety emerged as a negative indirect predictor of intention. This finding indicates that paraphernalia anxiety related to the blood donation environment affects the early stages of decision making about blood donation, but donation anxiety related to the donation experience plays a role as an immediate emotion on decision making (Loewenstein, 2005). Studies have shown that the presence of paraphernalia is sufficient to increase potential donors' anxiety and discourage them from intending to donate blood, and those clinics that rely heavily on some mobile sites, donors who strongly intend to donate may be discouraged from doing so by the blood donation images and paraphernalia present at the site (Clowes & Masser, 2012).

The goodness-of-fit tests showed satisfaction to be the strongest significant determinant of attitude in the revised model. These findings indicate satisfaction regarding the first experience donating blood to be positively related to a more positive attitude toward donating, which is consistent with Thomson et al.'s (1998) and France et al.'s (2007) surveys. Donors' intentions can still be influenced by organizational elements related to the act of donation (e.g., careful consideration of donor privacy, hygiene and ventilation of the donation environment, staff attention and efforts at donor comfort, staff knowledge, explanations about the procedure) and structural elements (e.g., increasing capacity/number of mobile blood donation to eliminate long wait times). However, the mobile blood donation vehicles do have a private room that is only used by doctors for one-on-one donor interviews. Blood donors may need a more private environment when completing the blood donor questionnaire in these vehicles which have limited space. TRC sometimes uses tents in the mobile donation teams, especially in areas where transport is scarce. Donors may need a more isolated donor interview area in these mobile donation tents. Additional precautions should also be adapted in blood donation areas such as a folding screen between the donor beds and a blanket, especially for female donors.

According to the goodness of fit tests, another predictor that has a direct effect on intention is motivation. This result shows social media campaigns to have had a reinforcing effect on initiating blood donation behavior and to be sufficient for increasing willingness. Furthermore, this result also indicates the TRC to have succeeded in changing the behavior of the population from being replacement donors to becoming voluntary donors during this period.

The other significant predictor of intention to donate in the next 6 months among Turkish first-time donors is self-identity. This study suggests that individuals begin to perceive themselves as a blood donor only after their first blood donation experience. Although many studies have determined self-identity as a function of repeated performance, where individuals come to perceive themselves over time as a role model who donates blood (Armitage & Conner, 2001a, 2001b; Charng et al., 1988; Giles et al., 1995; McMahon & Byrne, 2008). However, this study highlighted individuals to perceive themselves as role models for donors immediately after their first donation experience. Further research is needed to clearly assess whether individuals develop a self-identity after their first donation.

The goodness-of-fit tests found self-efficacy to have an indirect influence on blood donation intention, unlike previous studies that included experienced and non-donors (Armitage & Conner, 2001b; France et al., 2007; Giles & Cairns, 1995; Masser et al., 2009). This study, however, found self-efficacy to have a facilitating effect on self-identity. The donors who experienced their first blood donation developed a sense of being a role model that was induced by self-efficacy. This result also indicates self-efficacy to have a moderating effect on donation anxiety, which is consistent with previous studies (Giles at al., 2004; Lemmens et al., 2005; Masser et al., 2016). The experience of a successful blood donation and the associated positive psychological and affective reactions increase an individual's self-efficacy even after the first donation experience (Bandura, 1997; Giles et al., 2004).

The results from the goodness-of-fit tests revealed descriptive norm to have an indirect effect on intention by means of anticipated regret. In line with previous studies (Godin et al., 2007; Masser et al., 2009; Robinson et al., 2008), this study has also shown anticipated regret to be a direct positive predictor of intention to donate blood. However, while the results from the goodness-of-fit tests show the TRC model to have almost perfect fit, the model is not able to infer the behavior of the donor population because the analysis only included first-time donors.

## Conclusion

In this survey, we have conducted face-to-face interviews and analyzed the impact of demographic and behavioral factors on intention to donate blood. These findings suggest several potential ways to improve donor retention. The study's results provide important data in terms of donor retention that should be implemented in TRC's future strategies. We also evaluated some satisfaction factors such as hygiene and crowding of mobile units, as well as privateness during the donation process, as being important factors for first time donors to continue donating. We should take some measures for these issues to improve donor retention, such as increasing the capacity of blood donation units and training staff on helping donor's return. This survey has some limitations. First, the demographic survey was limited to first time donors, so it may not represent the whole population of donors. Secondly, the behavior pattern of first-time donors does not represent all donors in Türkiye. The next step should cover experienced donors and investigate the demographic and behavioral patterns of blood donation.

**Ethical approval**

Turkish Red Crescent Ethical Committee provided ethical approval for this study.

**Authors' contribution**

Conception/Design of study: N.N.S., M.U., Ş.Ç., S.S.Ç., K.K., F.M.Y.; Data Acquisition: N.N.S., M.U., Ş.Ç., S.S.Ç., K.K., F.M.Y.; Data Analysis/Interpretation: N.N.S., M.U., Ş.Ç., S.S.Ç., K.K., F.M.Y.; Drafting Manuscript: N.N.S., M.U., Ş.Ç., S.S.Ç., K.K., F.M.Y.; Critical Revision of Manuscript: N.N.S., M.U., Ş.Ç., S.S.Ç., K.K., F.M.Y.; Final Approval and Accountability: N.N.S., M.U., Ş.Ç., S.S.Ç., K.K., F.M.Y.

**Peer-review**

Externally peer-reviewed

**Acknowledgments**

Not applicable.

**Funding**

This research received no external funding.

**Disclosure statement**

The authors report no conflict of interest.

**Author's ORCID numbers**

| | |
|---|---|
| Nazlı Nadire Sözmen | 0000-0002-7783-0366 |
| Mustafa Ulukanlıgil | 0000-0002-0316-193X |
| Şükrü Çağlak | |
| Sıdıka Selin Çöplen | 0000-0002-5597-668X |
| Kerem Kınık | 0000-0002-6913-5312 |
| Fatma Meriç Yılmaz | 0000-0002-8252-6975 |

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**Appendix 1.**

*The Items Assessed in the Survey*

| Measures | | | Score | Cronbach's Alpha |
|---|---|---|---|---|
| 1 | **Attitude** | Donating blood makes me feel…[a, b]<br>*"pleasant", "unpleasant", "bad", "good", "relaxing", "stressful"* | 1 (strongly disagree) to 5 (strongly agree) | 0.837 |
| 2 | **Self-efficacy** | I have not difficulties donating blood [b] | 1 (strongly disagree) to 5 (strongly agree) | 0.694 |
| 3 | **Intention** | I would think about donating blood in the next 6 months [a,c]<br>I intend to donate blood in the next 6 months [a,c]<br>I will donate blood in the next 6 months [a,c] | 1 (strongly disagree) to 5 (strongly agree) | 0.917 |
| 4 | **Self-identity*** | It's important to me to donate blood<br>I am aware of the need for blood donations all year long. | 1 (strongly disagree) to 5 (strongly agree) | 0.694 |
| 5 | **Anticipated regret**** | I would …. If I don't donate blood again [a]<br>*"regret it", "grow restless"* | 1 (very unlikely) to 5 (very likely) | 0.927 |
| 6 | **Donation anxiety** | I feel…. while donating blood [b]<br>*"achy", "pain", and "nervous"* | 1 (very likely) to 5 (very unlikely) | 0.867 |
| 7 | **Paraphernalia anxiety** | … makes me feel distress while donating blood<br>*"Seeing blood"*<br>*"Pre-donation applications (measurement of blood pressure, hemoglobin etc.)"*<br>*"Seeing the blood donation area (needles, blood collection tubes, medical devices etc. associated paraphernalia (France et al., 2010)"* | 1 (very unlikely) to 5 (very likely) | 0.814 |
| 8 | **Personal moral norm** | …. affects my blood donation [c]<br>*"my faith", "my conscience", "my health"*<br>I feel a … to donate blood [c]<br>*"moral obligation", "personal responsibility" and "social responsibility"* | 1 (strongly disagree) to 5 (strongly agree) | 0.802 |
| 9 | **Descriptive norm***** | …. affects my blood donation [d]<br>*"my request of testing", "need of a member of my family and/or my folks"* | 1 (strongly disagree) to 5 (strongly agree) | 0.670 |

| | | | | |
|---|---|---|---|---|
| 10 | **Satisfaction** | I would donate blood if TRC offered… [e] | 1 (very unlikely) to 5 (very likely) | 0.630 |
| | | *"coffee/tea", "promotion material (pen, bag, mug etc.)"* | | |
| | | … affects my blood donation [f] | 1 (strongly disagree) to 5 (strongly agree) | |
| | | *"Proximity of the blood donation center/ blood donation vehicle to my home/job"*<br>*"A mobile blood collection team visiting where I am"* | | |
| | | The degree of satisfaction with the donation area [c] | 1 (displeasing) to 5 (satisfactory) | |
| | | *"level of ensuring of my privacy"*<br>*"level of staffs' attention/ effort toward my comfort"*<br>*"level of staffs' information/ explanations"* | | |
| | | … of blood donation area is important [d] | 1 (strongly disagree) to 5 (strongly agree) | |
| | | *"hygiene", "being in order/tidy", "ventilation"* | | |
| | | … negatively affects my desire to donate blood [c] | 1 (strongly disagree) to 5 (strongly agree) | |
| | | *"crowdedness of the blood donation environment", "waiting-period"* | | |
| 11 | **Motivation** | I would donate blood again if … [g] | 1 (strongly disagree) to 5 (strongly agree) | 0.736 |
| | | *"Turkish Red Crescent sends me notification/ text massage"*<br>*"I am willing to"*<br>*"I see the notifications on social media (Facebook/twitter/ Instagram etc.)"*<br>*"I see public service broadcasting"*<br>*"a member of my family is in need"* | | |
| | | My school/work conditions allow me to donate blood | | |

*, **, *** The intercorrelation items are 0.533, 0.864, and 0.504, respectively.

[a] Items based on those used by Godin et al. (2005)

[b] Items based on those used by Masser et al. (2009)

[c] Items based on those used by France et al. (2007)

[d] Items based on the TRC's experiences

[e] Items based on the TRC's past field application

[f] Items based on the differences in TRC's local centers

[g] Items based on certain TRC applications