The Relationship of Empathy and Altruism to Motivation to Blood Donation among Omani Students: a Predictive Study

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Abstract

Objectives. Different variables related to blood donation among college student donors were studied such as altruism, empathy, demography, and knowledge of blood donation. These variables were mentioned as factors affecting individuals' motivation to donate blood. This study was to explore the extent to which empathy and major contributed to the variance in motivation to blood donation among a sample of volunteers.

Methods. Three validated scales were administered to a total of 353 college students (58 blood donor females, 128 blood donor males, 64 non-donor females and 103 non-donor males) between December 2017 and April 2018, at Sultan Qaboos University (SQU) in Oman.

Results. The findings indicated that both empathy and altruism accounted for 92.1% of variance in motivation. Both variables also discriminated between three levels of blood donation and non-donation on motivation scale. Religious motivation was the highest amongst the other types of motivation as demonstrated by the participants. In addition, there were significant differences between blood donor males and females in motivation and empathy in favor of males, while there were significant differences between male and female non-blood donor males and females in motivation, that is these differences were in favor of males. Additionally, there were no significant differences in motivation to blood donation due to college.

Conclusion. These findings support the positive relationship between motivation to blood donation, empathy and altruism, that is significant correlational relationship between motivation to blood donation, empathy and altruism differed according to the type and state of the donation.

Keywords: empathy, altruism, motivation to blood donation, discriminate analysis, college students

Statement of Contribution

What is already known on this subject?

- The study of motivation to blood donation received a great deal of interest among sociologists, economists, and psychologists.
- Mutual effects of empathic behavior and perception are one of recent topics in positive psychology. Empathy – altruism is considered an important trait that aims at perceiving and understanding feelings accurately.

What does this study add?

- Based on the fact that volunteering to donate blood is a national and humanitarian issue, and the growing need in the Omani society for blood, as evidenced by the calls directed to students to donate blood, the current study was interested in studying the motivation of university youth to donate blood, and forecast through some social and psychological variables, especially the behavior of altruism and empathy, and through them gives a predictive model that may be useful in the field of blood donation.
- The findings demonstrate that behavior of blood donation is a supportive behavior which deserves in depth investigation, and it is necessary to emphasize that moral issues related to blood donation affecting personal attitudes by creating awareness of this need.

Introduction

Many countries in this world made a lot of effort to provide blood resources and encourage blood donation because it is a vital and a humanitarian action. Motivation to blood donation necessary for life and is considered a good indicator for increasing the percentage of blood donation and meeting the necessary needs currently and in the future. It is believed that 1% of people need to donate blood to meet the minimum requirement of blood for a country (WHO, 2014). The problem is how to find donors in developing countries (Lownik et al., 2012; WHO, 2014). Studies conducted on college students in these countries yielded similar results (Duboz & Cuneo, 2010; Lownik et al., 2012; Shaz & Hillyer, 2010).

In Oman, the statistics on blood donation movement indicated that 7000 blood units were collected in the year 1990 and reached 47,000 by 2008, 68,000 blood units by 2016 (Joshi, Alblushi & Ashraf, 2010). The directorate of blood services supports these results indicating that there is an increasing demand in blood donation and transfusion especially in patients with cancer and genetic blood diseases with average of double percentage compared to last year (Alhasmiah, 2016).

Blood bank in Oman also indicated that there is an acute deficiency in blood store although blood donors were 4,143 in 2005 and became 8,965 in 2015 (Blood bank in Oman, 2016). Since the university youth is the wealth of society, the pillar of health, physiological importance of blood donation will help them to develop motivation to blood donation in the future.

The donation campaigns focused on the current blood altruistic behavior and empathy with the individual donors, and they were based on the idea that blood donation is motivated by altruism (Ferguson et al., 2007; Ferguson, Farrell & Lawrence, 2008; Simon, 2003). The findings of research proved that the effect of motivation to blood donation affected the blood donors' behavior greatly. Many researchers (e.g., LaRocco, 2010; Ozcan et al., 2010; Ouzouni & Nakakis, 2012: Karacan et al., 2013; Sampath, Ramsara & Parasram, 2007; Suen, et al., 2020) emphasized that human motivation is one of the factors that plays an important role in blood donation.

Different issues related to blood donation among university student donors were studied such as altruism, empathy, demography, and knowledge of blood donation. These variables were mentioned as factors affecting individuals' motivation to donate blood (Ferguson, Farrell & Lawrence, 2008; Glynn, Kleinman & Schreibeer, 2002; Steele et al., 2008). Several studies were conducted on the motivation towards blood donation in male students only (Gader et al., 2011; Al-Faris, Bahabri, & Al-Aqeel, 2013; Godin et al., 2007). Elsafi, Al Zahrani and Al Zahrani (2015) used a stratified random sample of 444 college students from Dhahran, Saudi Arabia. A questionnaire on the awareness and practice of blood donation was administered, and the respondents reported good general knowledge of blood donation. Females had better knowledge than males, and more than 80% of the students reported a positive attitude, which was also higher in females than males. Approximately, 12 % of the total participants reported that they donated previously; vast majority of them were males.

Importance of Study

It is obvious that research on supportive behaviors is a part of the study of positive psychology. The behavior of blood donation is a supportive behavior which deserves in depth investigation. Seligman and Csikszentmiheely (2000) emphasized the necessity of helping others and achieving their social welfare, and providing them with the experience that strengthens them psychologically (Brunello, 2001l; Cowen & Kilmer, 2002).

Healy (2000) suggested that blood donation is primarily a voluntary work. It includes the psychological and emotional thrust more than making money. Previous research focused on

motivation to donation as an antecedent of blood donation behavior (Bednall & Bove, 2011; Bednall et al., 2013; Sojka & Sojka, 2008).

Social behavior depends on many human needs and motivations, and the most important of which is altruism. A person with a strong desire to be altruistic imbued with sympathetic feelings that drive the person to help others who suffer from a painful experience. The more empathy increases, the more there is an altruistic behavior (Mussen, 1979).

The study of motivation to blood donation received a great deal of interest among sociologists, economists and psychologists. Titmuss Designed a program on solving social problems related to blood donation (Schwartz, 1999). The International Academy (1971) indicated that 85% of American blood store was obtained by the donors. Blood donation is considered a national issue, and social structure is the base of individuals' motives, while the economic curve is based on the rule that blood donation mainly relies on rewarding the donors, but psychologically, this process relies on some traits such as altruism and empathy (Godin et al., 2007; Healy, 2000; Ortlberg, Gorsuch & Kin, 2001; Turiel, 2006). Recent research showed that positive human motives are the key prediction of blood donation behavior and constitute 31% to 86% of the change in this behavior (Baumeister, Masicampo, & Vohs, 2011; France, France & Himawan, 2007, 2008; Lemmens et al., 2005; Masser et al., 2008; Veldhuizen & Van Dongen, 2013).

Mutual effects of empathic behavior and perception are one of recent topics in positive psychology (Oswald, 2002). Empathy – altruism is considered an important trait that aims at perceiving and understanding feelings accurately (Rieffe, Ketelaar & Wiefferink, 2010).

This empathy induced altruistic motivation should shift the decisional balance in the direction of "cooperation" (Batson & Ahmad, 2001). It is important to keep in mind that empathy and altruism are sources for moral development and decision-making, both on an individual and a societal level (Lönnqvist et al., 2011).

Based on the fact that volunteering to donate blood is a national and humanitarian issue, and the growing need in the Omani society for blood, as evidenced by the calls directed to students to donate blood, the current study was interested in studying the motivation of university youth to donate blood, and forecast through some social and psychological variables, especially the behavior of altruism and empathy, and through them gives a predictive model that may be useful in the field of blood donation.

Literature and Previous Studies

The Empathy-Altruism Hypothesis

The empathy-altruism hypothesis states that feelings of empathy are motive force behind altruistic motivation (Batson, Lishner & Stocks, 2015). The empathy is defined as "the capacity to (a) be affected by, and share the emotional state of another, (b) assess the reasons for the other's state, and (c) identify with the other person by adopting his or her perspective" (De Waal, 2008, p.281). Empathy has two sides: cognitive and affective. Affective empathy is viewed as participating others in feelings, but cognitive empathy is viewed as perceiving beliefs and knowledge that contribute to understanding others feelings (Perssona & Kajonius, 2015; Pouw et al., 2013; Smith, 2006). This perception of cognitive empathy plays an important role in determining the individual activity of blood donation (Bednall & Bove, 2011; Ringwald, Zimmermann & Eckstein, 2014). As for the hypotheses of social psychology, altruism refers to an "other-oriented" motivational state or behavior with the primary goal of increasing or benefiting another's well-being (Batson, Ahmad & Lishner, 2009). However, in several experimental studies, these hypotheses failed to receive the same level of empirical support as found for the empathy-altruism hypothesis, indicating that empathy accounts for more variance in altruistic behaviors than do the egoistic motives (e.g., Dovidio et al., 2006). The central

proposition is that empathy entails emotions of concern for other people, and that altruism is comprised of genuine (not egoistic) pro-social values and behaviors. The idea that empathy-induced altruism can affect responses in blood donors has wide-ranging implications.

Davis (1983) is one of the researchers who tested the prediction from the empathy-altruism hypothesis that helping should be positively associated with empathy, and that empathy should be stronger for blood donors compared to non- donors, empathy's orientation is assessed as a trait. Moreover, numerous studies on donors' motivation found that donors reported altruistic motivation as their primary reason for donation (Healy, 2000; Pennings, 2005; Steele et al., 2008).

Motivation to Blood Donation

The social and psychological literature of motivation towards charitable work commonly refers to Sills (1957) as one of the pioneering researchers who categorized volunteers into a number of types: humanitarian volunteers (those driven by true desire to help others), volunteers affiliated with charitable societies' (those who hope to improve themselves, their self-esteem, and their societies), and good citizens who aim to build a virtuous society through their voluntary work. In addition, Argyris (1957, 1962) introduced a theory that considered individual needs drives for voluntary work and that the value of voluntary work was a key motivating factor. Clark (1997) contended that humanitarian motivation was one of the major factors leading to blood donation, which is motivated and reinforced by the awareness of the expenses and difficulties experienced by patients.

It seems that blood donor motivations for giving blood are multifaceted. There are numerous motivations for why some people give blood, mainly these are altruism/empathy, awareness of community/personal need, emotional benefit, and social pressure (Moore, 2009).

To understand the influence of motivation better on people, it should be realized that motivation can be divided into intrinsic and extrinsic motivations. Intrinsic motivation is stronger than extrinsic one. People with intrinsic motivation are internal, natural, and spontaneous, and they engage in the task for challenge and enjoyment, while people with extrinsic motivation are less influential, external, and attribute their works to external forces (Reeve, 2009).

Additionally, Armitage and Connor (2001) suggested that in order to improve motivation to blood donation, it is necessary to emphasize that moral issues related to blood donation affecting personal attitudes by creating awareness of this need. It is very important that self-efficacy is supported by donors' motivation to maintain their positive attitudes towards the behavior of blood donation, which should be intrinsically motivated (Ringwald et al., 2010).

Relation between the Empathy-Altruism and Motivation to Blood Donation

The relationship between empathy and motivation to blood donation was studied. For example, an authentic study by Andosy, Gul and Dinc (2016) showed that there was no significant relationship between empathy and motivation to blood donation among the students of Kurabuk Nursing Department. Findings of Jaafar et al. (2014) showed that there were six types of human values in the donors: responsibility, empathy, self-efficacy, non- subjectivity, altruism, and religiousness. Steele et al. (2008) found that most blood donors reported to have high levels of the primary prosaically characteristic (altruism, empathy, and social responsibility) commonly thought to be the main motivation for donation, but these factors do not appear to be most strongly related to donation frequency. Sojka and Sojka (2008) explored various self-reported motives for donating blood: influence from a friend, request via media, general altruism, social responsibility. Karacan et al. (2013) revealed that feelings of empathy or altruism, self-benefit and external reasons are motives to motivate the individual to donate blood based on altruism (Otto & Bolle, 2011).

Concerning the study variables, studies showed that there were significant differences in donors and non-donors in fear of blood, syringes and having infection which decrease the motivation to blood donation (Bednall & Bove, 2011; Duboz & Cuneo, 2010; Gader et al., 2011; Lownik et al., 2012; Olatunji, Etzel & Ciesielski, 2010; Sabu et al., 2011; Fergson & Lawrence, 2019). Some researchers noticed that blood donor motivation is not necessary, and governmental organizations are responsible for providing that service (Abdurrahman & Selah, 2014; Dubos & Cuneo, 2010; Lownik et al., 2012).

Empathy is one of things that received a great deal of research especially in its relation to gender, age, and psychological factors such as altruism (Christov-Moore et al., 2014). Research showed that there were significant differences in empathy between males and females; these differences were in favor of the female (Andosy, Gul & Dinc, 2016; Cunico et al., 2012; LaRocco, 2010; Muncer & Ling, 2006; LaRocco, 2010).

In the economic model of pure altruism, blood donations are motivated by public benefits, such as the supply of blood to patients and drug development (Piersma, et al., 2021; Pomona College, 2019). However, Hong and Morrow-Howell's study (2012) showed there were no significant differences between males and females in empathy.

Study Questions

This study attempts to determine the factors that affect blood donation levels and motivation to blood donation among the study sample by answering the following questions:

1. What is the relationship between motivation to blood donation and empathy-altruism due to gender, college, and donation state?
2. What factors can be extracted from the correlation coefficients?
3. Which of the variables of the study could discriminate between the three levels of motivation to blood donation (mild motivation, moderate motivation, high motivation)?
4. Are there any statistically significant differences in motivation to blood donation, empathy and altruism due to the variables of the type and state of the donation?
5. Is it possible to predict both the male and female group (donor, non-donor) through the averages of their answers to each of the predicting variables (motivation towards blood donation, empathy, and altruism)?

Objectives of the Study

The purpose of this study is to:

1. Determine the relationship between motivation to blood donation and empathy-altruism, gender, college, and donation state.
2. Identify the factors that can be extracted from the correlation coefficients.
3. Determine the variables of the study that could discriminate between the three levels of motivation to donate blood.

Methods

Participants

Participants who recruited to this study consisted of 353 college students. They were 58 females and 128 males who were considered blood donors, while the non-donors' participants were 64 females and 103 males. The females ranged in age from 20 to 30 years (M = 21.3, SD = 2.4); the males, from 20 to 32 (M = 22.8, SD = 2.6).

Materials and Procedure

Data of the study was collected from two self-assessment tools that were administered to volunteers (donors and non- donors) of students older than 18 years. This data was collected

from SQU students in Oman in 2015. After consenting to conduct the study, participants were asked to complete the used tools:

Instruments

Empathy behavior scale. The empathy quotient scale (EQ) was used to assess empathy behavior (Allison et al., 2011). This scale consisted of 60 items in its original version. The items were responded according to four-point scale as follows: *strongly agree*=3, *slightly agree* =2, *slightly disagree*=1, and *strongly disagree* = 0 for every question, so the minimum score of scale =0 and the maximum score =48. The EQ has high test-retest reliability (r = 0.97, p < 0.001; according to Baron-Cohen & Wheelwright, 2004) and good construct validity, that is, it correlated positively with social cognition scale (the 'Eyes' task; r =0.294, p < 0.05; according to Lawrence et al., 2004). It also has high internal consistency (Cronbach's alpha = 0.92; according to Allison et al., 2004).

Currently the most comprehensive assessment of the dimensionality of the EQ using a Rasch and confirmatory factor analysis suggested that the EQ is a one-dimensional measure (Allison et al., 2011). The reliability of the EQ in this dataset has been well established (Mathiesen, Tambs & Dalgard, 1999). Cronbach's alpha coefficients for empathy in girls and boys were 0.84 and 0.77, respectively. The final version of the Empathy Quotient Scale consisted of 50 items. In this study the validity of this questionnaire has been examined by a panel of psychologists. Cronbach's alpha was found .93, and the test-retest reliability on a sample size of 25 students with an interval of two weeks was .86.

Altruistic behavior scale. The self-report altruism (SRA) scale was used to assess altruistic behavior or helpfulness. Rushton, Chrisjohn and Fekken (1981), 28 items originally developed to quantify the level of helping or altruistic personality traits based on the frequency of self- reported helping behaviors. Steele et al. (2008) used in their study in America. Respondents were asked to answer the items according to a five-point scale as follows: *never* (1) to *very often* (5), so the minimum score of scale is 13 and the maximum score is 65. The SRA has good construct validity. The face validity of the scale was evaluated by a panel of professionals in psychology, mental health, and psychological counseling. The goal was to determine the extent to which items measure what they were designed to measure. Construct validity was assessed by factor analysis using the principal components approach (Hotelling). After that, items were rotated orthogonally with Kaiser normalization to identify the factor structure of the scale. The limits of acceptable loadings were statistically set at ≤ 0.30 as described by Papini, Grimani and Stephens (1996). Based on the rotated component matrix, the 28 items loaded on two factors. One item was dropped due to low item loadings of less than 0.30. Cronbach's alpha was found to be 0.80 (Rushton et al., 1981). In this study alpha was found to be 0.88.

Scale on motivation to blood donation. Participants also completed the scale on motivation to blood donation. This instrument was developed for measuring motivation to blood donation based on the literature review (Clark, 1997; Glynn et al., 2002: Kuntz, 2001; Perry, 1996; Windley, 2006). The scale included 50 items distributed into five different types of motivation. They are: human motivation, religious motivation, social motivation, nationality motivation, and family motivation. Each dimension has 10 items. Respondents were asked to answer the items according to a three point-scale as follows: agree, agree to some extent, disagree.

Based on a comprehensive literature review, the dimensions of motivation to blood donation were determined. To provide empirical evidence for the suggested five-factor structure of the scale, an exploratory factor analysis (EFA) was conducted. The five-factor model in which blood donors, human, religious, social, nationality and family motivations loaded on their designated factors. Based on the rotated component matrix, one item of the 50

items was dropped due to low item loading of less than 0.30 as suggested by Papini, Grimani and Stephens (1996). Cronbach's alpha was found to be 0.80 (Rushton et al., 1981). In this study alpha was found to be 0.78.

Results

Findings related to Q1: What is the relationship between motivation to blood donation and empathy and altruism for each of the following variables: gender, college, and donation state?

To answer the first part of the question, correlation coefficients between participants' responses on scales motivation to blood donation and empathy was computed according to the variables (gender, college, and the case of donation). Analysis showed as shown in Table 1.

Table 1. Pearson's correlation coefficients between motivation to blood donation and empathy behavior according to independent variables

Empathy Behavior						
Variables	Gender		College		State donation	
	Male	Female	Art	Scientific	Donation	Not donation
Human Motivation	0.654	0.416	0.652	0.542	0.483	0.475
Religious Motivation	0.625	0.841	0.733	0.701	0.487	0.725
Social Motivation	0.619	0.708	0.653	0.666	0.552	0.634
Nationality Motivation	0.803	0.749	0.763	0.804	0.676	0.628
Family Motivation	0.856	0.844	0.797	0.906	0.723	0.723

Note: *All Correlation is significant at the ≤ 0.01 level (2-tailed).

Finding shown in Table 1 indicated that motivation to blood donation was positively correlated with empathy for each of the mentioned variables. This correlation was statistically significant at the 0.01 level.

To answer the second part of the question, correlation coefficients between participants' responses on scales motivation to blood donation and altruism was computed according to the variables (gender, college, and the case of donation). Table 2 shows the results of this analysis.

Table 2. Pearson's correlation coefficients between motivation to blood donation and altruistic behavior according to independent variables

Empathy Behavior						
Variables	Gender		College		State donation	
	Male	Female	Art	Scientific	Donation	Not donation
Human Motivation	0.722	0.511	0.803	0.775	0.448	0.647
Religious Motivation	0.644	0.627	0.713	0.713	0.5.4	0.622
Social Motivation	0.811	0.728	0.809	0.871	0.594	0.704
Nationality Motivation	0.825	0.774	0.665	0.653	0.746	0.510
Family Motivation	0.733	0.764	0.630	0.816	0.651	0.458

Note: *All Correlations are significant at $p \leq 0.01$.

Findings shown in Table 2 indicated that motivation to blood donation was positively correlated with altruism for each of the mentioned variables, and this correlation was statistically significant at the 0.01 level.

Findings related to Q2: What factors can be extracted from the correlation matrix? To answer this question a factor analysis was conducted. Correlation coefficients between the study scales are shown in Table 3.

Table 3. Correlation coefficients of the study scales

Study scale	Donation	Human	Religious	Social	Nationality	Family	Empathy	Altruistic
Donation Motivation	1							
Human Motivation	.346**	1						
Religious Motivation	.718**	.321**	1					
Social Motivation	.648**	.233**	.414**	1				
Nationality Motivation	.782**	.160**	.362**	.405**	1			
Family Motivation	.851**	.164**	.442**	.463**	.717**	1		
Empathy behavior	.298**	.165**	.162**	.238**	.265**	.245**	1	
Altruistic behavior	.301**	.202**	.269**	.350**	.124*	.211**	.274*	1

Note: **. Correlation is significant at the ≤0.01 level (2-tailed). *. Correlation is significant at the ≤0.05 level (2-tailed).

Correlation coefficients, as shown in Table 3, between the study scales were statistically significant. Factor analysis was carried out using the principal components method. Table 4 shows the results of this analysis.

Table 4. Rotated Component Matrix from the correlations between metrics

Variable	Motivation	Human	Religious	Social	Nationality	Family	Empathy	Altruistic
Component	.652	.536	.709	.613	.774	.810	.663	.798

The results in Table 4 extracted one component. The loadings ranged between 0.536 and 0.810, and the explained variance was 60.541%. This factor is bipolar and can be called motivation to donate versus altruism and empathy.

Findings related to Q3: Which of the variables of the study could discriminate between the three levels of motivation to blood donation (mild motivation, moderate motivation, high motivation)?

To answer this question, the dependent variable was transformed (scores of motivation scale) into ordinal variable. The scores in this scale were distributed into three levels. To distinguish among the three levels, 1 Std. from the mean was added and subtracted for the motivation variable (M= 72, Std. = 11.2), noting that the range of scores in this scale was 0-100. Then, the sample was collectively distributed into three levels as follows:

1. Group one (high motivation): it represents the sample with high scores (72 + 11.2 = 83.4)
2. Group two (low motivation) it represents the sample with low scores (72- 11.2 = 60.2)
3. Group three (moderate motivation): it represents the sample with moderate scores, with scores ranging 60.2- 83.4).

A discriminate analysis was conducted to determine which independent variables are added to the differentiation function and become the most distinguishable from the three groups of motivation scale (dependent variable). The independent variables were Empathy and altruistic. Wilk's Lambda was used to identify the statistically significant variables that are added to discriminate function. The results in Table 5 revealed that Wilks Lambda coefficient for the variable altruism was 0.985 ($F = 19.648$, $p < 0.01$). Wilks Lambda coefficient for the variable sympathy was 0.999 ($F = 19.173$, $p < 0.01$). All the independent variables were

statistically significant in the power of the differentiation function. College, however, didn't discriminate between the levels of motivation in donating blood.

Evaluation of Discriminate Function Analysis

Two functions of discriminate analysis were derived; that is the number of derived functions is equal to the number of dependent variable (groups -1). Although the dependent variable is divided into three groups according to the blood donation scale scores (high, moderate, low); two independent functions were derived. These functions were used to discriminate dependent variable groups (Table 5).

Table 5. The discriminate function analysis (DFA)

Function	Eigen value	Canonical *r*	Wilks lambda	Chi-square	*p*	Variance %	Cumulative variance
1	.038	.82	.85	20.68	.01	92.1	92.1
2	.08	.09	.08	2.84	ns	07.9	100

Table 5 shows that:

1. The value of Eigen value of the first function was 0.38, which means that it explained 38% of variance in the dependent variable, and in the second function explained 8% of variance in dependent variable.
2. Canonical correlation of the first function was 0.82, and of the second function was 0.09. The value of the first correlation shows the importance of the model, and its strength in the discriminate function analysis, and strongly related dependent variable.
3. Wilks lambda coefficient of the first function was 0.85 and of the second function was .08.
4. The coefficient of the first function indicated the power of Wilk's Lambda to discriminate between observations. Because as the coefficient converged in to zero, it indicated the efficacy to discriminate.
5. Chi-square of the first function was 20.86 at p=0.01, which indicated the difference in three levels, while Chi-square of the second functions was 2.84 and not significant.
6. The percentage of variance in dependent variable explained by the first function was 92.1% and of the second function was 7.9 %, this percentage was very low.

***Findings related to Q4**:* Are there any statistically significant differences in motivation to blood donation, empathy, and altruism due to the variables of the type and state of the donation and gender? To answer this question MANOVA was used to find the significance of the differences in the participants' responses of the three standards due to the variables of the type and state of the donation as shown in Table 6.

Table 6. The findings of MANOVA of the significance of differences in the participants' responses of the three standards

IV.	DVs	Gender	Mean	Std. Deviation	F
Non-donation	f1	male	2.3738	.91655	3.035
		female	2.0962	.99528	
	f2	male	1.3290	.23792	.882
		female	1.2923	.21589	
	f3	male	1.3579	.30095	2.735
		female	1.2788	.24119	
	f4	male	1.2215	.19907	1.685
		female	1.2692	.25169	

	f5	male	1.8280	.24371	3.860*
		female	1.1923	.19081	
	Empathy	male	2.4082	.15154	1.643
		female	2.4591	.34967	
	Altruism	male	4.3122	.21940	3.461
		female	4.2349	.29350	
Donation	f1	male	2.6129	.48906	.028
		female	2.6000	.54904	
	f2	male	1.5129	.18739	.094
		female	1.5186	.18904	
	f3	male	1.5460	.21805	.600
		female	1.5186	.26664	
	f4	male	1.7024	.25645	.585
		female	1.6714	.29545	
	f5	male	1.6355	.28117	5.614*
		female	1.5400	.24754	
	Empathy	male	2.5055	.17506	13.266**
		female	2.5997	.16912	
	Altruism	male	4.3840	.21863	3.409
		female	4.4438	.21280	

Table 6 shows that there were statistically significant differences between the responses (donors), male and female, in the family motivation and empathy in favor of males. This may be due to the male donor groups having access to family support more than females, due to the nature of the female social role imposed by society habits, and style of parental upbringing practices in the Omani society. This parental support to males to donate blood and empathy may be larger than that of females. In addition, there were significant differences between male and female within the non-blood donors in the family motivation due to the nature of nurturing parenting in the Omani society that encourages males more than females in this field.

***Findings related to Q5**:* Is it possible to predict donation status among male and female respondents from the predictor variables (motivation towards blood donation, empathy, and altruism)? To answer the question four groups were created as follows: group 1 was male donators, group 2 was male non-donators, group 3 female donators and group 4 female non-donators. Table 7 shows the results of the discriminate analysis.

Table 7. The Eigen value and canonical correlation and Chi square and level of significance

Type of donation	Function	Eigen	Value % of variance	Cumulative	Canonical correlation	Wilks' Lambda	Chi square	df.	Sig.
Non-donation	1	.111[a]	100	100	.317	.900	16.225	7	.023
Donation	1	.269[b]	100	100	.46	.788	44.869	7	.000

Table 7 revealed that the Eigen value for non-donating individuals was 0.111 and thus differentiate between male and female respondents. The total canonical correlation was .317 indicating that 20% of the variance was due to the differences between the two groups in the discriminate function. The Eigen value for the donating group was .269, and the canonical correlation was .460. This coefficient indicates that 21% of the variation was due to the differences between the two groups in the discrimination function. It also was clear that the

value of chi square was only statistically significant within group (non-donor) in predicting variable of family motivation, after excluding other variables in favor of males. In addition, within the donor group, it was statistically significant across the two predicting variables (family motivation, empathy) in favor of males, after excluding the effect of other variables.

Discussion

It is clear from the results that religious motivation was the highest amongst the other types of motivations as reflected by the study sample, with both genders indicating so. This indicates the profound impact of religion in the Omani society in relation to blood donation. This result is in line with Healy (2000) who found that religious clergy and people who attended church were more likely to donate blood than other people. In a similar vein, national/patriotic motivation was the second most motivator for blood donation. This might indicate the significance of this factor and that it is deeply rooted among Omani college students. It is also a positive indicator of nationalistic spirit among the youth. In fact, this finding agrees with Nakayama, Muto, and Yoshiike (1999) that showed 31% of the study sample donated blood for the sake of their country's scientific advancement, leading them to work with the researching team.

Familial motivation was third among the factors leading to blood donation. This might be related to the patient's need for blood type that is similar in most family members. This is clearly observed in Omani families that urge and encourage their children to donate blood to others. This result is in consensus with Phillippa and John (1996) who found that family bonds were among the strongest factors leading to blood donation as family members' tendency to donate blood to their relatives or friends when needed. The fourth motivator to blood donation was the humanitarian motivator, which supported some of the previous studies such as Artman (1995), Phillppa et al. (1996), and Davies (2000) that found that human nature was an important motivator to blood donation. This might be attributed to the idea that morals may predict charitable behaviors. This idea was proposed and investigated by Bagozzi (1981) who found that "motivation towards blood donation was affected by the causal action model (Model causative verb), especially if the motivators were religious and moral values" (p. 3).

Finally, the social motivator was last among the motivating factors. This might be explained by the idea that blood donation is part of the individual's community service. This may be truer if the individual has successful social relationships and is highly valued among his people, which is theoretically referred to as "role identity". This finding, in fact, was like Kasraian and Maghsudlu (2012) who indicated the importance of social motivation in relation to blood donation.

It is shown that both empathy and altruism to helping others accounted for 92.1% of variance in motivation. Both variables also discriminated between levels of blood donation motivation, which would be a logical as altruism is constituted from empathy and morality. On the other hand, empathy is feeling what the other needs, and it is the sensing part of altruism. Thus, altruism is sublimated over empathy where the effect does not stop at empathy and exceeds it to helping others without hesitation.

It is, therefore, seen that both Omani male and female university students seek to donate blood to achieve happiness and benefit to patients, which as well is reflected on the donating students' own happiness. This was regardless of whether donation was motivated by religion, nationalism, family, or human aspects as results were in consensus with (Boston et al., 2001; Jaafar et al., 2014; Pouw et al., 2013).

As for significant differences in empathy and altruism behavior regarding gender and donation state (Donation and Non-donation), the study found significant differences in favor of males. This may be since the male donor groups have access to family support more than females, due to the nature of the female social role imposed by society habits, and style of

parental upbringing practices in the Omani society. This parental support to males to donate blood and empathy may be larger than that to females. As shown, there were significant differences between males and females within the non-blood donors in the family motivation variable differences. This as well might be due to the nature of nurturing parenting in the Omani society that encourages males more than females in this field. The reason could be interpreted as found by Healy (2000) who believed that "females were lighter than males, were more prone to anemia than males, had different physical health, and had different physiology as females get pregnant and give birth. Thus, they were less likely to donate blood than males" (p. 1635). This study was in line with (Andosy, Coul & Dinc, 2016; Cunico et al., 2012; LaRocco, 2010; Suen et al., 2020) that there were significant statistical differences in empathy and altruism behavior in favor of donating and non-donating males. However, the current findings were counter to Hong et al. (2012) who found no significant statistical differences between males and females. Therefore, in the light of the current findings, several recommendations were made:

1. There is a need to improve the design of educational, cultural, and counseling programs to motivate university students for voluntary blood donation and to raise their religious and humanistic motivation.
2. There is a need to design Rational Emotive Therapy programs to reduce the fear of blood donation.
3. There is a need to design counseling and educational programs to increase levels of empathy and altruism so as to increase blood donation motivation.
4. It is important to increase the communication level with the university community to tell students about the importance of blood donation and to avoid blood donation phobia.

Limitations

The limitations were in the participants, place of conducting study, administering study instruments, and using statistical method of discrimination analysis.

Conclusion

The study concluded that religious motivation of blood donors was the basic motive of blood donation, as well as empathy had greater role than altruism in instigating college students to blood donation, and males were highly motivated than females in donation and empathy.

Conflict of Interest

Authors declare no conflict of interests.

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