

DOI: <https://doi.org/10.63332/joph.v4i3.3466>

## Determinants of Voluntary Blood Donation: Motivations, Barriers, and Strategies for Enhancing Donor Recruitment and Retention in Madinah, Saudi Arabia

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### Abstract

*This study aimed to examine the key determinants of voluntary blood donation in Madinah, Saudi Arabia, focusing on identifying the major motivations and barriers and assessing their relationship with donor categories and socio-demographic characteristics. A sequential explanatory mixed-methods approach was employed. In the first phase, semi-structured interviews (n=25) were conducted to identify contextual themes, which subsequently informed the development of a structured survey administered in the second phase (n=50). The survey explored motivations, barriers, and demographic variables, and chi-square tests were performed to analyze associations with age, gender, education, and employment status. The findings indicated that altruism, religious and moral duty, and social responsibility were the most prominent motivations for blood donation. In contrast, fear of needles and pain, fear of weakness or dizziness, and lack of time emerged as the main barriers. Statistical analysis demonstrated significant associations between employment status and perceiving donation as a religious or moral duty ( $\chi^2=69.2, p<0.001$ ), as well as between education level and perceiving it as a social responsibility ( $\chi^2=14.7, p=0.02$  after collapsing categories). No significant associations were observed for age or gender.*

**Keywords:** Blood bank; Voluntary blood donation; Motivations; Barriers; Donor categories; Socio-demographic factors; Madinah; Saudi Arabia.

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## **Introduction**

Adequate blood supply is vital for modern healthcare systems, supporting emergency care, surgeries, oncology, and chronic disease management. Despite technological advances, many countries face persistent shortages, often due to limited voluntary donations (WHO, 2020). Saudi Arabia, with its rapidly growing population and rising healthcare demands, is no exception (Abolfotouh et al., 2017). Blood donation is not only a biomedical necessity but also a social behavior shaped by cultural, religious, and psychological factors (Bednall & Bove, 2011). In Islamic contexts, religious duty and moral obligation can act as powerful motivators (Al-Farsi et al., 2021). However, barriers such as fear, misconceptions, and logistical limitations reduce participation (Masser et al., 2008).

This study holds particular importance as it addresses a critical gap in understanding the socio-cultural determinants of voluntary blood donation within the context of Madinah, a city with unique religious and cultural dynamics (Al-Taie & Khattak, 2024). While global and regional research has consistently identified altruism and religious duty as central motivators (Bednall & Bove, 2011; Abolfotouh et al., 2017), limited evidence exists on how these factors interact with socio-demographic characteristics in Saudi Arabia (Khattak et al., 2014). By employing a mixed-methods design, this research not only provides a comprehensive view of motivations and barriers but also highlights the significant influence of education and employment on donor perceptions. These findings offer evidence-based insights for developing culturally tailored strategies, such as workplace-based campaigns and faith-oriented awareness initiatives, which are essential for strengthening donor recruitment and retention (Al-Farsi et al., 2021; Khalaf et al., 2021). Ultimately, the study contributes to both academic scholarship and practical policy development, thereby enhancing the sustainability of blood donation systems in the region.

### **Aim of the Study**

This study was guided by the following research questions:

What are the main motivations that drive individuals to donate blood voluntarily in Madinah?

What are the key barriers that prevent individuals from engaging in blood donation?

In what ways do motivations and barriers differ across donor categories (regular donors, occasional donors, and non-donors)?

1.1.1. Are socio-demographic factors (age, gender, education, and employment status) significantly associated with motivations and barriers to blood donation?

### **Hypotheses:**

H1: Altruism, religious duty, and social responsibility will be the most reported motivations.

H2: Fear-related and logistical concerns will be the most reported barriers.

H3: Employment and education will show significant associations with motivations and barriers.

### **Literature Review**

Extensive literature highlights altruism and the desire to save lives as consistent motivators (Ferguson & Chandler, 2005; Bednall & Bove, 2011). In Middle Eastern societies, religious and moral duty are particularly salient (Abdelrahman & Elnimeiri, 2011; Al-Farsi et al., 2021). Campaigns leveraging faith-based values have been effective in Saudi Arabia (Abolfotouh et al.,

2017). Conversely, barriers such as fear of pain, fear of dizziness, or misconceptions about infection risks are frequently documented (Masser et al., 2008; Zou et al., 2019). In Saudi Arabia, logistical challenges—distance to donation centers, inconvenient hours—compound these fears (Alam & El Din, 2013). Recent systematic reviews (Shaz & Hillyer, 2018; Khalaf et al., 2021) emphasize the need for culturally adapted interventions. The gap lies in understanding how demographic profiles intersect with motivations and barriers in specific regions such as Madinah, a city with unique religious and cultural dynamics.

## **Methods**

### **Study Design**

A sequential explanatory mixed-methods design was employed, consisting of two phases. Phase one involved a qualitative exploratory component, and phase two comprised a structured quantitative survey. This design was selected because it enables the integration of qualitative insights to inform quantitative instrument development, a strategy commonly recommended in mixed-methods research (Creswell, 2014).

Semi-structured interviews (n=25) were conducted with participants representing different donor categories (regular donors, occasional donors, and non-donors). The purpose of this phase was not to generate stand-alone results, but rather to identify key themes of motivations and barriers, which were subsequently used to construct the structured questionnaire. Therefore, the detailed qualitative findings are not presented in this manuscript, as their primary function was to guide instrument development.

### **Sampling**

Participants were selected using a purposive sampling strategy to ensure variation across donor categories. Respondents represented diverse socio-demographic backgrounds, including differences in age, gender, education, and employment status. All participants were informed about the study purpose and procedures. Participation was voluntary, confidentiality and anonymity were guaranteed, and informed consent was obtained. Participants retained the right to withdraw from the study at any time without consequence.

### **Data Collection**

The quantitative survey (n=50) was developed based on insights from the qualitative phase and included demographic variables, motivations (10 items, 5-point Likert scale), barriers (10 items, 5-point Likert scale), and open-ended questions.

### **Data Analysis**

Qualitative interview data were reviewed thematically to generate questionnaire items. Quantitative data were analyzed using IBM SPSS Statistics version 26 (IBM Corp., 2019). Descriptive statistics (frequencies, percentages, means) were calculated for all variables. Chi-square tests were conducted to examine associations between socio-demographic factors (age, gender, education, and employment) and reported motivations and barriers. To address sparse cells, Likert-scale responses were collapsed into three categories (Agree, Neutral, Disagree). A significance level of  $p < 0.05$  was considered statistically significant.

## **Results**

Analysis of the demographic data revealed that 60% of the participants were male, while 40%

were female. Regarding marital status, 70% of the respondents were married. In terms of employments, approximately 65% of the participants were employed at the time of the study. With respect to educational attainment, the majority of the sample held bachelor's degree. The age distribution ranged from 18 years to above 60 years, indicating representation across a wide range of age groups.

Characteristic	Distribution (%)
Gender	60% Male, 40% Female
Marital Status	Majority Married
Employment Status	Majority Employed
Education Level	Majority held a Bachelor's degree
Age Range	18 years to over 60 years
<b>Percentages are based on the quantitative survey sample (n=50).</b>	
<b>Table 4.1: Demographic Characteristics of the Study Sample</b>	

Descriptive results showed that altruism, religious/moral duty, and social responsibility were the top motivations, while fear of needles/pain, fear of weakness, and lack of time were the most common barriers. Chi-square analyses revealed significant associations: employment status × religious/moral duty ( $\chi^2=69.2$ ,  $p<0.001$ ) and education × social responsibility ( $\chi^2=14.7$ ,  $p=0.02$  after collapsing categories). No significant associations were observed for age and gender.

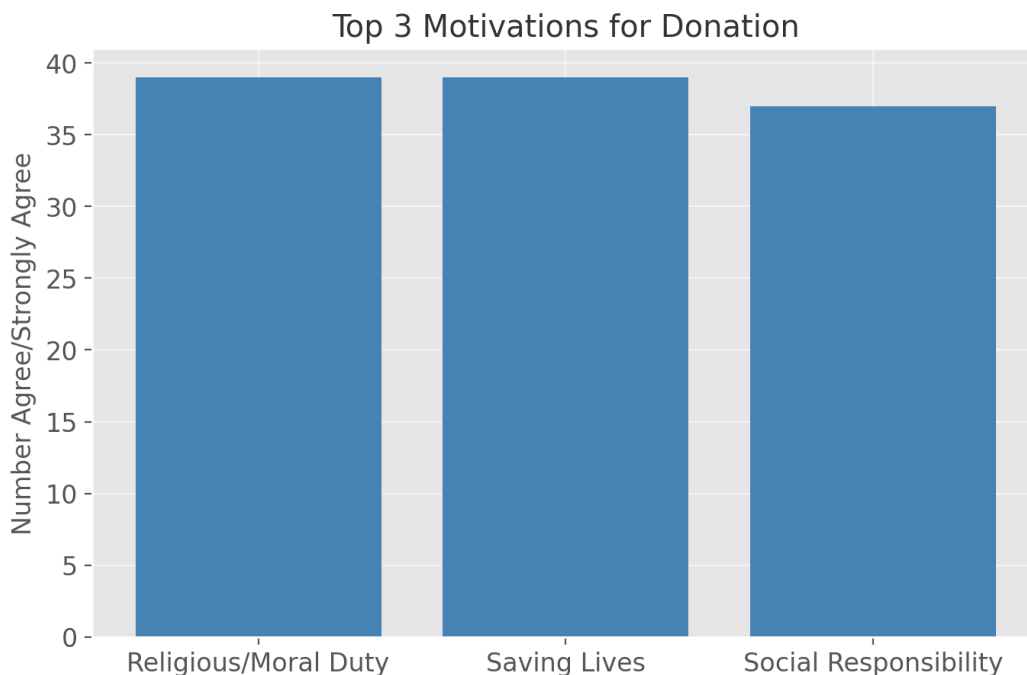


Figure 1. Top three motivations for blood donation (Religious/Moral duty, Saving lives, social responsibility).

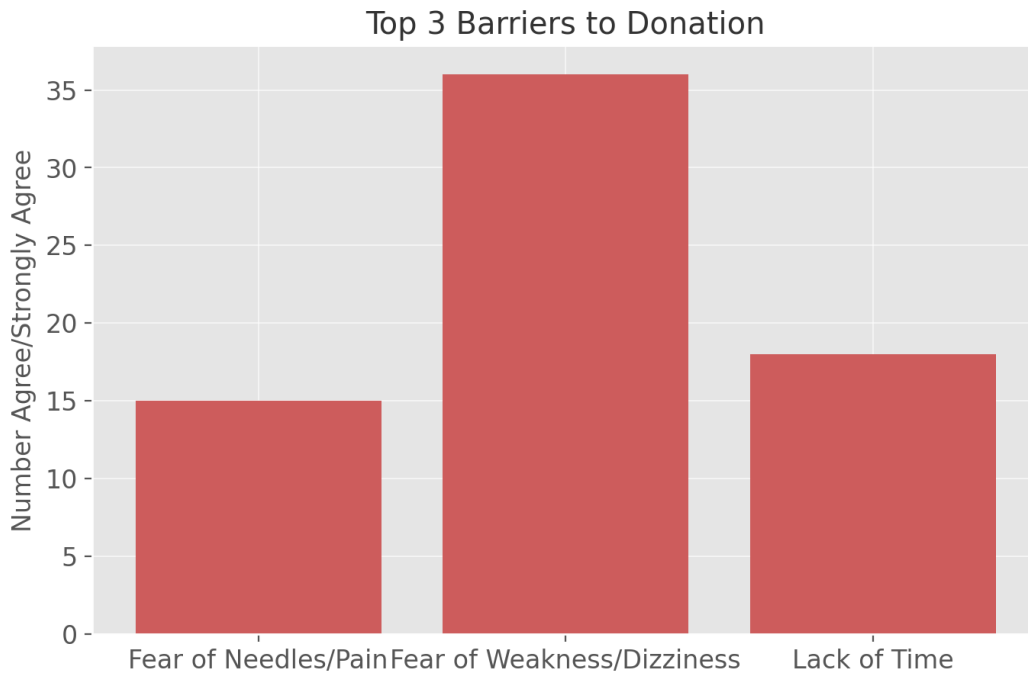


Figure 2. Top three barriers to blood donation (Fear of needles/pain, Fear of weakness/dizziness, Lack of time).

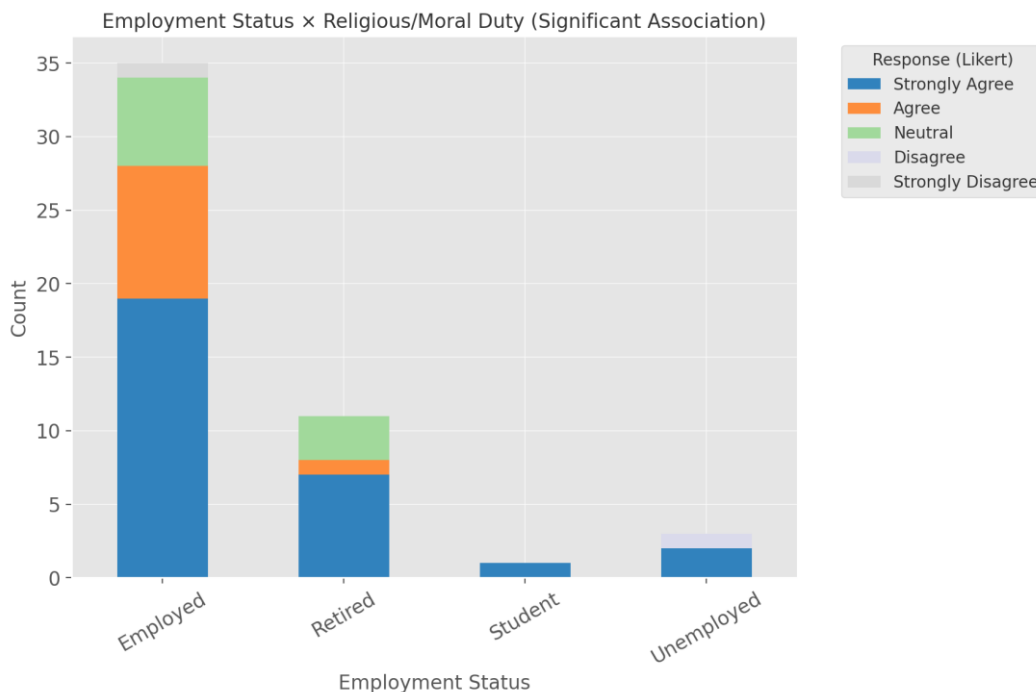


Figure 3. Significant association: Employment status × Religious/Moral duty (Chi-square analysis).

### Discussion

This study confirms the primacy of altruism and religious duty in motivating blood donation in Madinah, aligning with global and regional evidence (Bednall & Bove, 2011; Abolfotouh et al., 2017). Barriers such as fear and logistical issues remain consistent across contexts (Masser et al., 2008; Zou et al., 2019). Statistical evidence underscores the role of employment and education. Workplace-based campaigns may reinforce employees’ moral duty, while educational interventions can foster civic responsibility in younger populations. Strengths include the mixed-methods design, contextual adaptation, and robust analysis. Limitations include the modest sample size (n=50), reliance on self-reported measures, and potential influence of social desirability bias. Future research should incorporate larger samples, multi-regional comparisons, and behavioral validation with actual donation records.

Summary of Statistical Significance				
Independent Variable	Dependent Variable	Chi-square ( $\chi^2$ )	p-value	Significance
Employment status	Religious/Moral duty	69.2	<0.001	Significant
Education level	Social responsibility (5-cat)	ns	0.12	Not Significant
Education level	Social responsibility (3-cat)	14.7	0.02	Significant
Age group	Fear of weakness	ns	0.45	Not Significant
Gender	Altruism (Saving lives)	ns	0.33	Not Significant

**Note: 'ns' = not significant. Significance level set at  $p < 0.05$ .**

**Table 5.1; This Table provides a summary of Chi-square test results, including both 5-category Likert and 3-category collapsed Likert responses. It indicates whether a statistically significant association was observed between demographic factors and donor motivations or barriers.**

## Conclusion

This mixed-methods study provides new insights into the determinants of voluntary blood donation in Madinah, Saudi Arabia. The findings confirmed that altruism, religious and moral duty, and social responsibility were the dominant motivators, whereas fear of needles, fear of weakness, and time constraints represented the most persistent barriers. Statistical analysis further demonstrated significant associations between employment status, education level, and donor perceptions, while no significant associations were observed for age or gender. The practical implications of these results highlight several strategies directly aligned with the study's findings:

- Because religious and moral duty was strongly associated with employment status, workplace-based campaigns are recommended to reinforce employees' sense of obligation and facilitate organized donation opportunities.
- Since social responsibility showed a significant association with education, educational programs—particularly those targeting younger and more educated populations—can be effective in promoting civic responsibility and long-term donor engagement.
- As fear of needles, fear of weakness, and lack of time were identified as the most common barriers, the implementation of mobile blood donation units can reduce logistical challenges, while culturally and religiously tailored awareness initiatives can address misconceptions, alleviate fears, and build public trust.

Despite its contributions, this study has certain limitations, including a limited sample size, reliance on self-reported measures, and the potential influence of social desirability bias. These constraints limit the generalizability of the findings. Future research should therefore employ larger, multi-site samples, incorporate objective behavioral data such as actual donation records, and explore additional socio-cultural determinants across different regions of Saudi Arabia. In conclusion, improving voluntary blood donation rates requires not only robust medical infrastructure but also evidence-based strategies that are contextually adapted to cultural and religious values, thereby ensuring a safer and more sustainable blood supply.

## Funding

This work did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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