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Health Belief Model's Application in Blood Donation Policies

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Abstract

Blood donation is a critical public health necessity, yet many countries, including Greece, face persistent challenges in maintaining a sufficient and sustainable blood supply. The Health Belief Model (HBM) offers a robust framework for understanding the motivations and barriers influencing blood donation behaviors. This study aims to investigate the factors that affect blood donation at a hospital in a rural region of Greece (i.e., Agrinio General Hospital), focusing on demographic variables and the six HBM constructs: perceived severity, perceived susceptibility, perceived benefits, perceived barriers, cues to action, and self-efficacy. A cross-sectional survey was conducted with 165 voluntary blood donors between February and April 2023. Data were collected using a structured questionnaire based on the HBM framework and analyzed using descriptive and inferential statistics. The majority of participants were male (55.76%), aged 31–50 years (30.30%), and employed full-time (90.32%). Donors demonstrated high perceived severity of blood shortages (66.7%) and significant altruistic motivation (87.2%). Key barriers included fear of needles (71.5%) and practical difficulties such as inconvenient donation hours (72.1%). Cues to action, including SMS reminders (57.6%) and proximity of donation events (48.5%), were critical facilitators. Self-efficacy was high, with 74% expressing confidence in their ability to donate regularly. In conclusion, demographic factors and HBM constructs were found to significantly influence blood donation behavior. Addressing psychological barriers, enhancing

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accessibility, and leveraging cues to action can improve donor recruitment and retention. These findings provide actionable insights for designing targeted strategies to achieve sustainable blood supply systems in Greece and similar contexts.

JEL Classifications: I12, I18

Keywords: Blood donation, psychological attitudes, blood transfusion, Greece

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1 Introduction

Blood donation is an essential pillar of healthcare systems worldwide, playing a critical role in life-saving interventions such as surgical procedures, emergency trauma care, and the treatment of chronic conditions like cancer and blood disorders. Despite its importance, many countries, including Greece, face persistent challenges in maintaining a sufficient and sustainable blood supply. Seasonal variations in donor availability, coupled with increasing healthcare demands, exacerbate the issue. For example, in Greece, blood shortages are most pronounced during summer months and holidays, when the incidence of road accidents and elective surgeries typically increases (Gkirtsou et al., 2005). These shortages underscore the urgency of understanding and addressing the factors that motivate or deter individuals from donating blood.

The World Health Organization (WHO) has emphasized the importance of voluntary non-remunerated blood donation (VNRBD) as the foundation for a safe and sustainable blood supply (WHO, 2010). However, Greece, like many other countries, has not yet achieved the WHO's target of 100% VNRBD. A significant proportion of the country's blood supply is still sourced from replacement donations, where family members donate on behalf of patients, rather than from regular, altruistic donors. Cultural, practical, and psychological barriers often hinder the recruitment and retention of voluntary donors, making it crucial to identify strategies to overcome these challenges.

Understanding blood donation behavior requires a multidimensional approach, as it is influenced by both individual psychological factors and broader societal dynamics. The Health Belief Model (HBM) provides a robust framework for examining these behaviors, offering insights into why individuals choose to engage—or not engage—in health-related actions like blood donation. Developed by

Rosenstock (1966), the HBM posits that health behaviors are shaped by six key constructs: perceived severity, perceived susceptibility, perceived benefits, perceived barriers, cues to action, and self-efficacy. These constructs explain how individuals assess the need for a health-related behavior, weigh its potential benefits and obstacles, and decide to act.

In the context of blood donation, the HBM has been widely applied to explore both motivations and deterrents. In the case of blood donation, perceived severity and susceptibility refer to individuals' understanding of the consequences of blood shortages and their personal or societal vulnerability to these consequences. Perceived benefits encompass altruistic motivations, such as saving lives, as well as potential personal health benefits, while perceived barriers often include fear of needles, concerns about health risks, and practical issues like time constraints or inconvenient donation locations (France et al., 2007; Masser et al., 2009). Cues to action—such as public awareness campaigns, reminders, or family encouragement—serve as external triggers that prompt individuals to donate. Finally, self-efficacy reflects the confidence individuals have in their ability to donate blood, particularly if they are first-time donors.

2 Literature review and research hypotheses

Previous studies have highlighted the importance of addressing both psychological and structural factors to improve donor recruitment and retention. For instance, Masser et al. (2009) found that emphasizing the societal impact of blood donation and addressing common fears could significantly enhance donor engagement. Also, Ferguson (2015) found that emphasizing the societal impact of blood donation and addressing common fears could significantly enhance donor engagement. Additionally, Bednall et al. (2013) identified that individuals with higher self-efficacy and stronger social support systems are more likely to become repeat donors. Similarly, a study by Siu et al. (2022) emphasized the role of motivational and deterrent factors, particularly in crisis situations like the COVID-19 pandemic, in influencing donor behavior.

While existing literature provides valuable insights, there is a need for localized research that considers the unique cultural, social, and healthcare contexts in which blood donation occurs. Studies conducted in Western countries may not fully capture the motivations and barriers present in other regions with differing healthcare infrastructures and societal attitudes toward blood donation. For instance, Oo et al. (2024) explored risk behaviors among first-time blood donors in Myanmar, highlighting context-specific

challenges that may not be apparent in studies conducted in other regions. Furthermore, research has shown that young adults often exhibit low donor retention rates despite being targeted in many recruitment campaigns (Silva et al., 2024). This underscores the importance of understanding age-specific motivations and barriers, as well as tailoring interventions accordingly. For example, online and social media-based campaigns have been shown to effectively engage younger populations (Albarracín et al., 2024).

This study seeks to fill the gap in the literature by applying the HBM to examine the motivations and barriers influencing blood donation behavior at a rural region in Greece in Agrinio General Hospital in Greece. By considering both individual psychological factors and broader systemic influences, this research aims to provide actionable insights that can inform more effective blood donation initiatives within the Greek healthcare context. Based on the above, the research hypotheses are the following:

H1: Higher perceived susceptibility to blood shortages is positively associated with increased intention to donate blood.

H2: Individuals with higher perceived severity of health consequences related to blood shortages are more likely to donate blood.

H3: Greater perceived benefits of blood donation lead to a higher likelihood of actual donation behavior.

H4: Perceived barriers, such as fear of needles or misinformation, negatively impact the intention to donate blood.

H5: The presence of strong cues to action, such as awareness campaigns and peer influence, positively influences blood donation behavior.

H6: Higher self-efficacy in managing the donation process increases the likelihood of donating blood.

By integrating demographic data analysis with the HBM framework, this study aims to provide actionable recommendations for improving donor recruitment and retention efforts. The findings are

expected to contribute to the broader understanding of blood donation behaviors and inform the development of culturally sensitive and evidence-based strategies to achieve a sustainable blood supply.

3 Method

This study employs a cross-sectional design to examine the motivations and barriers influencing blood donation behavior at Agrinio General Hospital. The Health Belief Model (HBM) serves as the theoretical framework to explore the psychological and structural factors affecting donor behavior. The research was conducted at the blood donation center of Agrinio General Hospital and included external donation drives organized by local volunteer blood donor associations. Data collection took place over a two-month period, from February 15 to April 15, 2023.

The target population consisted of voluntary blood donors aged 18 years and older. A total of 165 participants were recruited using a convenience sampling method during their visit to the hospital's blood donation center or participation in external donation events. Participants eligible for the study were individuals who had donated blood at least once during the data collection period. Non-consenting individuals and those with medical contraindications to blood donation were excluded. Data were collected using a structured self-administered questionnaire designed to assess demographic characteristics and the six constructs of the Health Belief Model. The questionnaire comprised 54 items and was divided into the following sections. Specifically:

1. Demographics: Age, gender, marital status, educational attainment, and employment status.
2. Donation History: Frequency of blood donation, years of experience as a donor, and motivations for first donation.
3. HBM Constructs:
    - *Perceived Severity:* Awareness of blood shortages and their consequences.
    - *Perceived Susceptibility:* Personal and societal risks related to blood shortages.
    - *Perceived Benefits:* Altruistic and personal advantages of donating blood.
    - *Perceived Barriers:* Physical, psychological, and logistical challenges.

- *Cues to Action:* Influence of reminders, family encouragement, and proximity to donation events.

- *Self-Efficacy:* Confidence in the ability to donate blood regularly.

Most responses were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was adapted from validated tools used in previous blood donation studies (France et al., 2007; Masser et al., 2009) and tailored to align with the HBM framework. The questionnaire was pilot-tested with 15 voluntary blood donors to ensure clarity, relevance, and reliability. Minor adjustments were made to improve the wording of certain items. The Cronbach's alpha coefficient for internal consistency was 0.85, indicating high reliability.

Ethical approval was obtained from the ethics committee of Agrinio General Hospital prior to data collection. Participants were informed about the study's purpose, confidentiality of their responses, and their right to withdraw at any time without consequence. Informed consent was obtained from all participants.

Data were analyzed using SPSS version 25.0. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize demographic data and responses to HBM constructs. Inferential statistical tests were applied to explore relationships between demographic factors and HBM components. Specifically, the Chi-square tests were used to assess associations between categorical demographic variables (e.g., age, gender) and categorical HBM responses (e.g., agree/disagree on barriers). Also, the Mann-Whitney U tests were applied to compare responses between experienced and first-time donors. In all tests, a p-value of <0.05 was considered statistically significant.

3 Results

The results of the study are presented in two parts: (1) the demographic profile of the participants and (2) findings based on the constructs of the Health Belief Model (HBM). Statistical analysis was conducted to evaluate the relationships between demographic factors and HBM components. The demographic characteristics of the participants are summarized in **Table 1**.

Table 1: Demographic Characteristics of Participants

Demographic Characteristics	**Frequency (n)**	**Percentage (%)**
Gender		
Male	92	55.76
Female	73	44.24
Age Group		
18–30 years	34	20.61
31–50 years	50	30.30
51+ years	81	49.09
Marital Status		
Married	96	58.18
Single	69	41.82
Educational Level		
Secondary School	73	44.24
Higher Education	92	55.76
Employment Status		
Public Sector	60	36.36
Private Sector	44	26.67
Unemployed	61	36.97

Findings from the survey based on the HBM framework are detailed below, with key data presented in tables. Participants recognized the importance of blood donation and the potential consequences of shortages.

Table 2: Perceived Severity of Blood Shortages

Perceived Severity of Blood Shortages	Agree (%)	Neutral (%)	Disagree (%)
Awareness of general blood shortage	66.7	22.1	11.2
Shortages during summer months	35.8	28.5	35.7
Shortages due to accidents or emergencies	50.0	30.3	19.7
Greece cannot meet demand with donations	30.3	40.6	29.1

The majority of participants viewed blood donation as a socially valuable act and identified various personal benefits, as shown in **Table 3**.

Table 3: Perceived Benefits of Blood Donation

Perceived Benefits of Blood Donation	Agree (%)	Neutral (%)	Disagree (%)
Blood donation is a social contribution	87.2	8.5	4.3
Blood donation improves personal health	64.8	22.1	13.1
Creates a reserve for future emergencies	32.7	45.5	21.8

Participants identified several barriers to blood donation, including physical concerns and practical issues. The findings are summarized in **Table 4**.

Table 4: Perceived Barriers for Blood Donation

Perceived Barriers	Agree (%)	Neutral (%)	Disagree (%)
Fear of needles	71.5	15.8	12.7
Fear of health risks	70.9	18.2	10.9
Inconvenient donation hours	72.1	20.0	7.9

Participants highlighted the importance of reminders and proximity of donation events, as shown in **Table 5**.

Table 5: Cues to Action for Blood Donation

Cues to Action for Blood Donation	Agree (%)	Neutral (%)	Disagree (%)
SMS or email reminders	57.6	25.5	16.9
Family encouragement	36.4	38.8	24.8
Workplace or residential proximity	48.5	31.2	20.3

Confidence in the ability to donate blood regularly was high among participants, particularly among experienced donors. The results are shown in **Table 6**.

Table 6: Self-Efficacy in Blood Donation

Table 6. Self-Efficacy in Blood Donation Item	Agree (%)	Neutral (%)	Disagree (%)
Confidence in becoming a regular donor	74.0	18.8	7.2
Willing to donate again in six months	74.0	15.8	10.2

Chi-square tests revealed statistically significant associations between demographic factors and HBM components:

- **Age and Perceived Barriers**: Younger participants (18–30 years) reported significantly higher fear of infection and needles compared to older participants ($p < 0.05$).
- **Employment and Accessibility**: Private sector employees were more likely to cite inconvenient donation hours as a barrier ($p < 0.01$).

Mann-Whitney U tests further indicated that experienced donors were less likely to perceive barriers compared to first-time donors ($p < 0.05$).

4 Discussion and Conclusions

This study provides novel insights into the motivations and barriers influencing blood donation at a Greek rural hospital (i.e., Agrinio General Hospital(through the lens of the Health Belief Model (HBM). The findings underscore the multifaceted nature of blood donation behaviors, shaped by demographic factors, psychological constructs, and situational barriers. This discussion contextualizes these findings

within the broader literature, highlights implications for practice, and identifies areas for future research.

The demographic profile of the participants revealed that the majority of donors were male, aged 31–50 years, married, and employed full-time, with secondary or tertiary education. These results align with previous studies that indicate middle-aged individuals and those with higher educational attainment are more likely to engage in altruistic behaviors, such as blood donation, due to greater awareness of societal needs and a sense of responsibility (Gkirtsou et al., 2005; Bani et al., 2014; Sereti et al., 2021).

Younger donors exhibited higher levels of perceived vulnerability to risks, such as infections, reflecting heightened health concerns. This finding corroborates earlier research that identified health-related apprehensions as a common barrier among younger populations (Gillespie & Hillyer, 2002; Eltewacy et al.,2024). Conversely, older donors were more likely to frame blood donation as a civic duty, suggesting that appeals to community solidarity may resonate more strongly with this group.

The study confirms the utility of the HBM in understanding blood donation behaviors. Each component of the model offers distinct insights into the factors that motivate or deter potential donors. Participants demonstrated a strong awareness of the critical importance of blood availability, with a significant proportion recognizing the challenges posed by seasonal shortages and emergency demands. These perceptions align with findings by Masser et al. (2009), who highlighted that awareness of blood scarcity can motivate individuals to donate. Younger donors, in particular, exhibited heightened perceived susceptibility, which could be effectively leveraged in recruitment messaging that emphasizes the immediate and universal need for blood.

Altruism emerged as a key motivator, with 87.2% of respondents identifying blood donation as a valuable social contribution. This is consistent with global findings that altruism and community responsibility are primary drivers of blood donation (France et al., 2007). The perception of health benefits, cited by 64.8% of participants, further underscores the dual motivation for donation. These findings suggest that framing blood donation as both a social and health-positive behavior may enhance donor engagement (Sereti et al., 2021).

Barriers to donation were significant and multifaceted. Fear of needles and potential health impacts were prominent concerns, mirroring prior studies that identified fear and health apprehensions as primary deterrents (Mc Lennon & Rogers, 2018; Monteiro et al.,2024). Practical issues, particularly

incompatible donation hours, were another critical barrier. These findings underscore the need for operational adjustments, such as extended hours and mobile donation units, to address accessibility issues.

Effective cues to action, including SMS reminders, social media outreach, and community-based donation drives, were highlighted by participants as motivators for donation. Nearly half expressed a preference for workplace or residential proximity in donation events, emphasizing the importance of convenience in recruitment strategies. This aligns with evidence that localized, community-based campaigns significantly enhance donor participation (Masser et al., 2009). High self-efficacy among experienced donors (74%) indicated that positive initial experiences are critical for fostering long-term engagement. Janz and Becker (1984) emphasized the role of self-efficacy in health behavior adherence, suggesting that interventions to build confidence, particularly among first-time donors, can yield substantial benefits for donor retention.

The findings of this study offer several important implications for public health policy, blood donation campaigns, and future research. As for policies:

- **Targeted Awareness Campaigns:** Understanding the role of perceived severity and susceptibility suggests that public health authorities should emphasize the risks associated with blood shortages to encourage donation.
- **Reducing Perceived Barriers:** Since logistical and psychological barriers hinder donation, hospitals and blood banks should implement strategies such as mobile donation units, appointment-based donations, and improved donor care services.
- **Strengthening Cues to Action:** Increasing the visibility of donation drives, incorporating social influence, and utilizing digital reminders (e.g., SMS, emails) can help enhance donor motivation.

As for practical applications for blood donation drives:

- **Enhancing Donor Self-Efficacy:** Training and providing information on the donation process can boost confidence, particularly among first-time donors.
- **Community Involvement and Peer Influence:** Encouraging donation within social and workplace networks may increase donor retention and participation rates.

As for future research directions:

- **Longitudinal Studies:** Future studies could assess how donation behaviors evolve over time and whether repeated exposure to campaigns increases donation frequency.
- **Intervention Studies:** Experimental designs testing different messaging strategies (e.g., fear-based vs. benefit-focused) could identify the most effective ways to influence behavior.
- **Diverse Population Studies:** Expanding research beyond a single hospital setting to include different demographics could provide broader insights into donor behavior.

Overall, the use of a validated framework (HBM) strengthened the study's theoretical foundation. Also, this study adds to the growing body of research on blood donation behaviors by applying the HBM framework in a specific cultural and healthcare context. The findings corroborated global trends while highlighting unique cultural and logistical factors influencing blood donation in Greece. By demonstrating the interplay between HBM constructs and demographic characteristics, the study appears to provide a robust basis for designing targeted interventions to improve donor recruitment and retention

However, the sample size was relatively small and confined to a single geographical region, limiting generalizability. Future studies should expand the sample size and include diverse populations across multiple regions to enhance the applicability of results. Additionally, while the HBM was effective in understanding donor behaviors, integrating complementary models such as the Theory of Planned Behavior (TPB) could provide a more comprehensive understanding of the factors influencing blood donation. Qualitative approaches, including in-depth interviews and focus groups, could uncover nuanced motivations and barriers not captured in a structured survey. Longitudinal studies are also needed to evaluate the long-term effectiveness of targeted interventions, assessing their impact on donor retention and frequency of donation.

To conclude, this study validated the applicability of the Health Belief Model in analyzing blood donation behaviors and highlighted actionable strategies for addressing key barriers. By tailoring interventions to demographic-specific needs, enhancing accessibility, and fostering long-term engagement, blood donation programs can improve both recruitment and retention rates. These findings have practical implications for healthcare systems seeking to build sustainable blood supply networks and contribute to the broader goal of achieving 100% voluntary, non-remunerated blood donation.

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