

Original Research Paper

Anxiety levels of voluntary blood donors in the blood donor unit of PMI Yogyakarta City

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Abstarct

Adverse events have an impact on the safety of blood donors and affect the interest in donating blood again. This adverse event is related to the anxiety experienced by blood donors. This study aims to determine the level of anxiety of voluntary blood donors after blood donation at the Blood Donor Unit PMI Yogyakarta City. This research is a descriptive research. The research instrument used the Hamilton Anxiety Rating Scale (HARS) questionnaire. The population in this study were blood donors at the PMI Blood Donor Unit, Yogyakarta City. The sampling technique uses quota sampling. The sample in this study were voluntary blood donors as many as 100 people who met the requirements for blood donation. Requirements for blood donors include physically and mentally healthy, age 17-60 years, minimum weight 50 kg, hemoglobin 12.5-17 g/dl, blood pressure 110/70 mmHg to 150/90 mmHg, and for women who are not pregnant/ breastfeeding/menstruation. Data were analyzed descriptively and presented with tables. The results showed that the majority of voluntary blood donors in the Blood Donor Unit PMI Yogyakarta City did not have anxiety (93%). Mild anxiety is most common in the younger age group, female gender, higher education and university students. Building and increasing self-efficacy, providing a positive blood donation experience, and mechanisms to reduce the rate of vasovagal reactions are important things to do to reduce anxiety, prevent vasovagal reactions and maximize donor retention.

Keywords: anxiety level; blood donation; blood donor unit; voluntary blood donors

1. Introduction

Accessibility to safe and adequate blood supplies, blood products and transfusion services is an integrated part of a qualified health care system. This is important for efforts to achieve universal health standard (World Health Organization, 2017). Blood transfusions in developed countries often use to treat malignancy, hematology in addition to helping cardiovascular surgery, transplantation and severe trauma. Meanwhile, in developing countries, blood transfusions are more commonly used to treat pregnancy complications and severe anemia in children (World Health Organization, 2017).

The lack of availability of blood supply is a serious problem that must be faced by the Indonesian Red Cross (PMI). The report on the realization of blood receipts in 2011 in Yogyakarta recorded that there were 43,164 bags (1.25%) of the total population of 3,547,491 people. Ideally, the availability of blood stocks are 69,150 bags (2%) of the total population (PMI Kota Yogyakarta, 2021). This lack of blood availability is apparently associated with adverse events, in the form of vasovagal reactions that are common after donors donate their blood. Vasovagal reactions are very closely related to anxiety. Most donors, as many as 85% who experienced vasovagal reactions felt anxious before they donated their blood (Agnihotri et al., 2012). The anxiety that donors experienced was generally caused by fear of injections, anxiety about falling unconscious, feeling sick, fear of blood and some were even afraid of the medical environment (France et al., 2019; Moloney et al., 2017; van Dongen et al., 2013).

The prevalence rate of adverse events in blood donors ranges from 0.37 - 2.5% (Agnihotri et al., 2012; Dogra et al., 2015). Therefore, it is necessary to pay attention to adverse events because of their impact on the safety of blood donors who can also reduce their interest in returning to donate their blood, even though it has a small prevalence (Wang et al., 2019). Lack of attention to this situation will disrupt the stability of blood availability at the blood supply service centre. The World Health Organization (2017) stated that the recruitment and retention of blood donations is important to improve the safety and quality of the blood supply. It is clear that this issue is quite urgent. For this reason, the study conducted for the purpose of determining the level of anxiety of voluntary blood donors after blood donation at the Blood Donation Unit of PMI Yogyakarta City.

2. Research Method

This research is a descriptive quantitative study. The study population was blood donors at the Blood Donation Unit (UDD) of PMI Yogyakarta City. The sampling technique used *quota sampling* with inclusion criteria : physically and spiritually healthy, aged 17-60 years, body weight of at least 50 kg, hemoglobin 12.5- 17 gr/dl, blood pressure 110/70 - 50/90 mmHg, and not being pregnant/breastfeeding/menstruating (for women). The study sample amounted to 100 people, and the data collection was carried out in July 2022. The instrument study used Hamilton Anxiety Rating Scale (HARS) questionnaire in Indonesian version that had been modified to measure all signs of anxiety both psychic and somatic (Ramdan, 2019). This instrument consisted of 14 questions with a Likert Scale using 5 alternative answers including Weight Once (4), Weight (3), Medium (2), Light (1), and None (0), while categories and ranges of anxiety level values are found in Table 1.

Table 1. Categories and range of anxiety levels

Category	Range in values
No anxiety	< 14
mild	14 – 20
Moderate	21 – 27
Severe	28 – 41
Very severe	42 – 56

The validity of this research instrument has been tested with the following results: person correlation value between 0.529 – 0.727 and reliability with the result of an alpha value of 0.75 (Ramdan, 2019). The data that has been collected is then analyzed descriptively and presented in the form of a table. This research has been approved by the Health Research Ethics Commission of the Faculty of Health, Jenderal Achmad Yani University Yogyakarta, with ec number: SKep/242/KEPK/VII/2022.

3. Results and Discussion

3.1. Characteristics of Respondents

The characteristics of respondents were grouped by age, gender, level of education, and type of work. The characteristics of the respondents are summarized in table 2. Based on table 2, it is known that the majority of respondents are in the age range of 26 - 45 years (39%), the most are male (67%), the highest level of education is college (60%) and more work as private employees (29%). The results of this study showed that men participated more in blood donation compared to women. These results are in line with some of previous studies that show similar results (Cheraghali, 2012; Kasraian

et al., 2021; Madrona et al., 2014; Pourfathollah et al., 2015; Studte et al., 2019; Wang et al., 2019). Even in Iran, as much as 94.8% of the blood supply is obtained from male donors (Cheraghali, 2012). These results increasingly proved the dominance of men as routine blood donors over women.

Table 2. Characteristics of respondents

Characteristics	Frequency	Percentage (%)
Age		
17-25 years	26	26
26-45 years	39	39
46-65 years	32	32
Gender		
Male	67	67
Female	33	33
Education		
Primary Education	1	1
Secondary Education	33	33
Higher Education	60	60
Miscellaneous	6	6
Type of work		
Self-employed	25	25
Student	23	23
Private Employees	29	29
Civil Servants	3	3
Farmer	4	4
Miscellaneous	6	6

The low participation rate of female donors is associated with various factors such as fear of anemia, weakness and dizziness after donors or due to medical conditions (Kasraian et al., 2021). Deficiency of iron in women is a problem that tends to occur in reproductive age due to the process of menstruation, pregnancy and lactation. Higher deferral of blood donation in women due to anemia, lack of weight, low blood pressure, medical incompatibility and other health problems (Kasraian & Negarestani, 2015).

In this study, the majority of respondents were highly educated as much as 60%. This result is equivalent to the results of studies in India and Iran which showed that highly educated respondents, 56.7% and 79.48%, respectively, participated more in blood donation (Kasraian et al., 2021; Saha & Chandra, 2016). Saha & Chandra (2016) found that age and education were significantly related to the willingness to donate blood. According to Renzaho et al. (2013), education and information regarding the importance of blood donation are important factors in decision making for blood donation. Higher education encourages respondents to more easily access information about blood donation, have a better socioeconomic status, access to social activities and access to a healthier life (Kasraian et al., 2021). PMI as a blood supply unit is expected to be more active in promoting programs related to education and promotion about the importance of blood donation to increase community participation in blood donation.

3.2. Voluntary Blood Donor Anxiety Level

3.2.1. Voluntary Blood Donor Anxiety Levels In General

The anxiety of voluntary blood donors at UDD PMI Yogyakarta City is divided into the following 5 levels: no anxiety, mild anxiety, moderate anxiety, severe anxiety, and severe anxiety. It is shown in Table 3.

Table 3. Anxiety levels of voluntary blood donors

Anxiety Levels	Frequency (f)	Percentage (%)
No anxiety	93	93
Mild	6	6
Moderate	1	1
Severe	0	0
Very Severe	0	0
Total	100	100

Table 3 shows that the majority of voluntary blood donors at UDD PMI Yogyakarta City do not experience anxiety (93%). This is likely due to previous blood donation experiences and also high self-efficacy. A person who first donates blood is more likely to have higher fear and anxiety than those who have repeatedly donated blood (Wang et al., 2019). Donors who have repeatedly donated blood are more confident and less fear is possessed (France & France, 2018; Newman, 2014).

Some research results showed significantly that self-efficacy is negatively related to anxiety (Muñoz et al., 2018; Qudsyi & Putri, 2016). Based on Social Cognitive Theory, self-efficacy has a role in controlling potential threats that have an important effect on anxiety. A person who is unable to control the threat is likely to experience high anxiety (Bandura, 1988). The anxiety experienced by blood donors is generally caused by adverse events in the form of vasovagal symptoms, fear of blood and needles and pain due to blood donation, and fear of not being worthy of donors (Chen et al., 2022; France et al., 2013; Gilchrist et al., 2019).

According to van Dongen (2015) self-efficacy is one of the predictor factors of blood donation. The term self-efficacy refers to one's self-confidence and ability to donate blood. Low self-efficacy can be an obstacle to blood donation. On the other hand, donors who are able to overcome anxiety problems related to blood donation will have high self-efficacy so that they are then moved to become blood donors. Several studies have also found that self-efficacy is significantly positively related to the intention to return to blood donation (Bednall et al., 2013; Li et al., 2021). On the contrary, fear and anxiety are the causes of blood donors being reluctant to return to donate blood (France & France, 2018; Kowalsky et al., 2014; Li et al., 2021; Masser et al., 2013; Merz et al., 2018; Moloney et al., 2017; Stock & Möckel, 2021; van Dongen et al., 2013). The blood donation service provider unit is tasked with maintaining the stability of the blood stock by finding new donors or retaining old donors. If previous donors were reluctant to donate blood back, it is feared that this will have an impact on reducing blood stocks. Education about the importance of blood donation, increasing the self-efficacy of donors, and providing a good and enjoyable donor experience are ways to overcome these problems.

3.2.2. Voluntary Blood Donors Anxiety Levels by Age

The age group of 26 - 45 years was the group that did not have the most anxiety among the other two groups (37%). The age group of 17 - 25 years is the group with the majority having mild

anxiety (4%). From this study it was found that anxiety is most prevalent in the younger age group of donors. This is shown in [table 4](#).

Table 4. Voluntary blood donor anxiety levels by age

Age	Level of anxiety					
	No Anxiety		Mild Anxiety		Moderate Anxiety	
	F	%	f	%	f	%
17 -25 year	28	28	4	4	0	0
26-45 year	37	37	1	1	1	1
46-65 year	28	28	1	1	0	0

The anxiety of voluntary blood donors is often associated with adverse events ([Newman, 2014](#)). Adverse events and anxiety are interrelated, because adverse events (vasovagal) can be caused or cause anxiety ([van Dongen et al., 2013](#)). Although the number of these cases is relatively small, adverse events have an impact on the safety of blood donations and reduce interest in blood donations again ([Wang et al., 2019](#)). The results of research in Saudi Arabia found 1.1% adverse event incidence, with mild and severe levels of 0.65% and 0.45% respectively ([Almutairi et al., 2017](#)). Mild adverse events have symptoms in the form of nausea, dizziness, headache, pallor, chills, and nervousness. Symptoms of severe adverse events include hypotension, emesis, seizures, respiratory disorders, and syncope ([Almutairi et al., 2017](#)). [Agnihotri et al. \(2012\)](#) found that vasovagal reactions (63.5%) or hematomas (35.0%) were frequently reported adverse events. Adverse events occur significantly higher in donors younger than 30 years of age ([Almutairi et al., 2017](#)).

The results of previous studies reported that young age, first time donor, high blood pressure, rapid pulse, body mass index (BMI) were less associated with the risk of vasovagal reactions ([Gilchrist et al., 2015](#)). Donors under the age of 35 are more at risk of developing vasovagal reactions ([Wang et al., 2019](#)). According to [Wang et al. \(2019\)](#) a higher risk of adverse events in younger blood donors is likely to be associated with the presence of higher baroreflex sensitivity (BRS) in young people compared to older donors. Physical and psychological stress has an impact on increasing the pulse rate, causing vagal stimulation and resulting in bradycardia and hypotension ([Wang et al., 2019](#)). This is in accordance with the results of a study [Taylor et al. \(2015\)](#) which found that BRS is associated with healthy young women.

Anxiety in younger donors may also be related to a lack of experience and knowledge about blood donation, such as the results of research [Newman \(2014\)](#) which shows that half of young donors are first-time donors, where they do not know much about blood donation in addition to their lack of experience. Building and improving self-efficacy, providing a positive blood donation experience, and reducing the rate of vasovagal reactions are important things to do to prevent vasovagal reactions and maximize donor retention.

3.2.3. Voluntary Blood Donor Anxiety Levels By Gender

Based on [table 5](#), male voluntary blood donors had mostly no anxiety (64%), while the majority of female volunteer donors had mild levels of anxiety (4%). This shows that women are more prone to experience anxiety compared to men. This explains that women are more prone to experience anxiety compared to men. The results of previous studies showed that women experienced greater distress and anxiety both before and after blood donation and experienced more severe adverse events ([van Dongen et al., 2013](#)).

Table 5. Voluntary blood donor anxiety levels by gender

Gender	Anxiety Levels					
	No Anxiety		Mild		Moderate	
	f	%	f	%	f	%
Male	64	64	2	2	1	1
Female	29	29	4	4	0	0

One part of the emotional process that is directly related to anxiety is the conscious fear (Park et al., 2018). Fear is a significant factor that causes donors to be reluctant to return to donate their blood (France et al., 2019). Common fears experienced by blood donors are fear of syringes, fear of getting sick during the blood donation process, fear of fainting and fear of seeing blood (France et al., 2019; France & France, 2018; Moloney et al., 2017). Fear and anxiety are associated with vasovagal reactions (Agnihotri et al., 2012; Masser et al., 2013). Some factors significantly related to vasovagal reactions include female sex, low weight, first-time donor, type of blood draw place, and low blood pressure at the time before donation (Agnihotri et al., 2012; Gilchrist & Ditto, 2015; Hasan et al., 2020).

3.2.4. Voluntary Blood Donor anxiety Levels Based on Education Level

Table 6 explains that the majority of donors with higher education did not experience anxiety (57%). The results of previous studies found that blood donation reactions, pain during donors and education level are independent risk factors that are significantly associated with the anxiety of voluntary blood donors (Yaxin, 2019). Respondents with higher education have easier access to information about information about blood donation (Kasraian et al., 2021). The information that they obtain can increase respondents' knowledge about blood donation which has an impact on increasing self-efficacy so that they can overcome anxiety. On the other hand, people with low education are more prone to experience anxiety because of limited access to information.

Table 6. Voluntary blood donor anxiety levels by education level

Education	Anxiety Levels					
	No anxiety		Mild		Moderate	
	f	%	f	%	f	%
Primary Education	1	1	0	0	0	0
Secondary Education	30	30	2	2	1	1
Higher Education	57	57	3	3	0	0
Miscellaneous	5	5	1	1	1	1

3.2.5. Anxiety Levels of Voluntary Blood Donors On An Occupational Basis

Table 7 shows that more volunteer blood donors who work as self-employed people do not experience anxiety (25%) than other groups. Donors from the college student group experienced the most mild anxiety (3%) while donors who were private employees were the only group who experienced moderate anxiety (1%). Higher mild anxiety in college students is likely associated with young age, first donor, absence of blood donation experience, as explained in the previous discussion.

Table 7. Voluntary blood donor anxiety levels by occupation

Occupation	Anxiety Levels					
	No Anxiety		Mild		Moderate	
	f	%	f	%	f	%
Self Employed	25	25	0	0	0	0
Student	20	20	3	3	0	0
Private employees	27	27	1	1	1	1
Civil Servant	3	3	0	0	0	0
Farmer	4	4	0	0	0	0
Miscellaneous	14	14	2	2	0	0

4. Conclusion

The majority of voluntary blood donors at UDD PMI Yogyakarta City did not experience anxiety (93%). Mild anxiety is most common in the younger age group, female gender, higher education and university students. Increasing self-efficacy and providing education regarding positive blood donation experiences are important things to do to reduce anxiety, prevent vasovagal reactions and maximize donor retention.

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