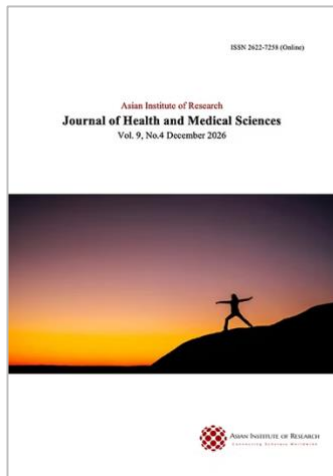




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Perceived Knowledge, Motivating Factors, and Deterring Factors of Voluntary Blood Donation Practices Among Medical Students

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Abstract

Blood donation is a life-saving act that is crucial for the survival of patients requiring transfusion. However, persistent blood shortages remain a pressing public health concern despite ongoing policies and recruitment initiatives, with the youth, particularly medical students, underutilized as potential blood donors. This study examined the factors associated with blood donation practices by assessing perceived knowledge, motivations, and barriers to inform youth-centered blood donation promotion strategies in addressing critical blood shortages. A descriptive correlational study was conducted using proportionate stratified random sampling among 200 students in a medical school in Cebu, Philippines. Data collection used a modified questionnaire on blood donation practices, perceived knowledge ($\alpha = 0.83$), deterring factors ($\alpha = 0.84$), and motivating factors ($\alpha = 0.93$). Data were analyzed using Chi-square and Cramer's V tests with statistical significance at $p < 0.05$. Despite the majority having high perceived knowledge of pre-donation health screening, 67.5% had never donated blood. Only 32.5% donated, mainly when an urgent need arises in friends or relatives. Motivation levels were generally low to moderate, with minimal deterrence, particularly lack of time. Perceived knowledge showed a weak but statistically significant association with donation behavior, while no significant associations between donation behavior and motivation and deterrence factors. While medical students demonstrate strong health literacy, this does not translate into regular blood donation behavior. Highlighting time-related barriers and promoting emotional connection to blood donation through flexible, personalized strategies that may improve youth participation in voluntary blood donation programs.

Keywords: Blood Donation Behavior, Donor Barrier, Donor Motivation, Health Promotion, Medical Students

1. Introduction

The World Health Organization (WHO, 2023) recognizes blood and blood components as essential medicines in the management of conditions such as severe anemia, traumatic injuries, and cancer (Essential Medicines (EML), 2023; Myers & Collins, 2024). As there is no artificial substitute for blood, its availability depends on the willingness of individuals to donate voluntarily (Graf et al., 2023). Although high-income countries account for only about 16% of the world's population, they contribute roughly 40% of global blood donations. In contrast, many low- and middle-income countries report an average of just six donations per 1,000 individuals, falling short of the WHO-recommended target of ten (Barnes et al., 2022). Shortages impact obstetrics, pediatrics, and surgery; for example, peripartum hemorrhage causes 25% of maternal deaths in sub-Saharan Africa, and delayed pediatric transfusions raise mortality (Jacobs et al., 2024). These shortages hinder progress on the United Nations Sustainable Development Goals (SDGs).

The Republic Act No. 7719, Philippine National Blood Services Act (1994) created the National Voluntary Blood Services Program (NVBSP) to encourage voluntary blood donation nationwide, aiming for donations from 1% of the population annually, matching WHO goals (Department of Health, 2024). The law promotes voluntary donations, especially in schools, to raise youth awareness. However, only 53% of the national target was reached between 2017–2020, with a drop of 365,000 units in 2020 (Philippine Red Cross, 2020). Awareness is high, but regular donors are few (Mappala et al., 2023), making it essential to address motivators and barriers (Antonio, 2023). Enacted in 2019, the Universal Health Care Act (Republic Act No. 11223) promotes equitable access to safe and affordable blood services, aligning with Sustainable Development Goal 3 on health, while also reinforcing SDG 4 on education and SDG 17 on partnerships (*THE 17 GOALS | Sustainable Development*, n.d.).

Although studies on youth's high awareness on blood donation predominates in most literature, knowledge about factors influencing their behavior remains limited particularly among medical students. Medical students have greater knowledge and motivation (Gebresilase et al., 2017), making them potential advocates for blood transfusion. As future healthcare providers, analyzing these data are essential in improving their knowledge, correcting misconceptions, and encouraging advocacy can help strengthen the blood supply. This study examined the perceived level of knowledge, motivating factors, and deterring factors among medical students with the aim of informing curriculum enhancement and fostering health advocacy, community involvement, and altruistic values.

The main objective of this study was to assess medical students' perceived knowledge and their views on factors that encourage or discourage voluntary blood donation across their sociodemographic variations during the academic year 2024–2025. This study offers insights to improve blood donation programs by incorporating students' perspectives, addressing their motivations, knowledge gaps, and misconceptions. Findings can guide targeted outreach by NVBSP, Professional Regulation Commission (PRC), and other agencies, while the institution can use them in curricula and activities to foster a culture of giving. For students, results support informed choices and advocacy. The findings of this study also offer a foundation for future investigations into blood donation behaviors among medical students in diverse contexts.

2. Method

A descriptive correlational design was used to examine perceived knowledge, motivating and deterring factors that influenced voluntary blood donation practices among medical students during the academic year (A.Y.) 2024–2025. The study was conducted at a private nonsectarian medical institution in Mandaue City, Cebu, Philippines for A.Y. 2024–2025. Respondents were medical students aged 18+, enrolled in Excel-MED through Level 4 for stratified analysis. Clerks, residents, and non-medical students were excluded. Using proportionate stratified random sampling, 200 of 539 students were selected: 19 Excel-MED (9.3%), 81 Level 1 (40.8%), 53 Level 2 (26.4%), 31 Level 3 (15.8%), and 16 Level 4 (7.8%). Sample size was based on Mappala et al. (2023), with a $\pm 5\%$ margin of error at 95% confidence and finite population correction.

A modified self-administered questionnaire adapted from Mappala et al. (2023) collected sociodemographic data, donation practices, and perceived knowledge, motivators, and deterrents. The 57-item modified questionnaire underwent expert validation by two medical technologists and one psychometrician. A pilot test with 25 conveniently selected students confirmed acceptable to excellent reliability (Perceived Knowledge $\alpha=0.83$; Deterring Factors $\alpha=0.84$; Motivating Factors $\alpha=0.93$). The questions on perceived knowledge were modified from "I am aware..." to "I know..." since the original questionnaire was designed for the general population, while the present study focused on post-graduate medical students. Additionally, subdomains included in the original instrument were removed to simplify the questionnaire and focus solely on the primary factors affecting blood donation practices. Multiple-choice questions were used for sociodemographic profile and level of blood donation practice, while sections on perceived knowledge, motivating, and deterring factors include 4-point Likert-type questions. The Likert scales were interpreted as follows: "Strongly agree" for 4, "Agree" for 3, "Disagree" for 2, and "Strongly disagree" for 1 with the following categories for the three domains: highly perceived for score range 3.26-4.00; moderately perceived for score range 2.51-3.25; slightly perceived for score range 1.76-2.50; and no perception at all for score range 1.00-1.75.

Each respondent gave informed consent for their participation. Recruitment used privacy-compliant email ("Bcc") and Facebook Messenger reminders. Responses were verified via screenshots, coded for anonymity, and data destroyed after three years. Data analysis in IBM SPSS Statistics 23 used descriptive statistics and Chi-square tests (5% significance level) with Phi or Cramer's V for effect size, merging categories when assumptions were violated.

The study was ethically approved by the Institutional Ethics Review Committee and assigned to protocol code 2024-174-Medino III-VoluntaryBloodDonation. All collected data were anonymized and securely stored in a password-protected Google Drive that was accessible only to the research team and was eventually destroyed in accordance with the disposal protocol.

3. Results

The sociodemographic profile as shown in Table 1 consists of 200 medical students with 100% response rate for A.Y. 2024–2025 that most were aged 24–26 (67%), female (69.5%), and single. Socioeconomically, 39.5% were from rich households, Roman Catholic (82%). A large majority (95%) had a health-related pre-med background, and nearly all were Filipino (98%).

Table 1: Sociodemographic profile of the medical students

Sociodemographic Profile		Frequency (f)	Percentage (%)
Age	18-20 years old	18	9.0
	21-23 years old	31	15.5
	24-26 years old	134	67.0
	27-29 years old	11	5.5
	≥30 years old	6	3.0
	Total	200	100.0
Sex	Male	61	30.5
	Female	139	69.5
	Total	200	100.0
Civil Status	Single	198	99.0
	Married	2	1.0
	Widowed	—	—
	Separated	—	—
	Total	200	100.0
Monthly Family Income (in pesos)	Less than 10,957	6	3.0
	10,957 to 21,914	5	2.5

	21,915 to 43,828	11	5.5
	43,829 to 76,699	30	15.0
	76,670 to 131,483	36	18.0
	131,484 to 219,140	33	16.5
	More than 219,140	79	39.5
	Total	200	100.0
Religion	Roman Catholic	164	82.0
	Christian Denomination	14	7.0
	Muslim	9	4.5
	Protestant	8	4
	Others*	5	2.5
	Total	200	100.0
Pre-Medicine Course	Health-Related Course	190	95.0
	Non-Health-Related Course	10	5.0
	Total	200	100.0
Nationality	Filipino	196	98.0
	Non-Filipino**	4	2.0
	Total	200	100.0

*The category "Others" under "Religion" includes Seventh Day Adventist, Iglesia ni Cristo, Agnostic, and None.

**The category "Non-Filipino" under "Nationality" includes American, Filipino-Japanese, Filipino-Taiwanese, and Sudanese.

Results showed that most medical students (67.5%) had never donated blood. Among medical students who had donated, the largest proportion (63.1%) reported doing so only when there was an urgent or immediate need, while smaller proportions donated annually (24.6%) or twice per year (12.3%).

The majority of participants (167, 83.5%) indicated a high level of perceived knowledge regarding voluntary blood donation. Item analysis on perceived knowledge in Table 2 shows that awareness of health history screening questions ranked highest, followed by knowledge of health restrictions, while understanding of donation intervals ranked lowest.

Table 2: Item Analysis on the Level of Perceived Knowledge of Voluntary Blood Donation among medical students

Item No.	Item	Weighted Mean	Standard Deviation	Interpretation*
Item 301	I know my blood type	3.83	0.59	Highly perceived
Item 302	I know that health history questions are necessary to be asked for in every donation.	3.90	0.34	Highly perceived
Item 303	I know that the minimum weight for blood donation is 50 kg (110 lbs).	3.68	0.74	Highly perceived
Item 304	I know that individuals aged 18 to 65 years old are eligible to donate blood, as well as 16 to 17 years old provided that they have their parents' written consent.	3.77	0.52	Highly perceived
Item 305	I know that the approximate amount of blood taken from a donor is 450 ml (one blood bag).	3.59	0.73	Highly perceived
Item 306	I know that it only takes 24-48 hours for the body to replace the amount of fluids lost from a blood donation, and 10-12 weeks to completely replace the red blood cells.	3.59	0.67	Highly perceived
Item 307	I know that a person with uncontrolled diabetes or hypertension, who has recently menstruated with a low	3.85	0.42	Highly perceived

	hemoglobin level, or who has undergone recent surgery cannot donate blood.			
Item 308	I know that the recommended interval between two successive donations is three months.	3.52	0.82	Highly perceived
Item 309	I know that a pregnant or breastfeeding woman cannot donate blood.	3.72	0.60	Highly perceived
Item 310	I know that in the Philippines, it is illegal to pay a person for blood donation.	3.63	0.76	Highly perceived
Item 311	I know that individuals who have smoked within the past three hours or have had tattoos or piercings within the past year are not allowed to donate blood.	3.80	0.50	Highly perceived
Item 312	I know that donating blood does not pose a risk in giving the donor a disease.	3.63	0.75	Highly perceived
*Legend: 1.00-1.75 = No perception at all; 1.76-2.50 = Slightly perceived; 2.51-3.25 = Moderately perceived; 3.26-4.00 = Highly perceived				

Most students reported a slight (88, 44%) to moderate (82, 41%) perception of motivating factors for blood donation, indicating generally low to moderate motivation among respondents. Item analysis on motivating factors in Table 3 shows that personal need, especially helping relatives, was the primary motivator, followed by social awareness, while peer pressure ranked lowest.

Table 3: Item Analysis on the Level of Perception of Motivating Factors of Voluntary Blood Donation among medical students

Item No.	Item	Weighted Mean	Standard Deviation	Interpretation*
Item 401	I will donate blood because of peer pressure.	1.32	0.59	No perception at all
Item 402	I will donate blood because everyone is doing it.	1.41	0.65	No perception at all
Item 403	I will donate blood because I'm associated with some organization.	1.81	0.85	Slightly perceived
Item 404	I will donate blood if the blood donation centers can be easily contacted for inquiries.	2.75	1.05	Moderately perceived
Item 405	I will donate blood if the staff of the blood donation facilities are hospitable, welcoming, and have high quality of care.	3.10	0.96	Moderately perceived
Item 406	I will donate blood because there are donation facilities near me.	2.68	1.00	Moderately perceived
Item 407	I will donate blood because it is my social responsibility to help unknown people who need it.	3.06	0.94	Moderately perceived
Item 408	I will donate blood because I am aware of the shortage of blood supply, so I want to support them to maintain their target supply.	3.14	0.92	Moderately perceived
Item 409	I will donate blood if my family, relatives, or friends need it.	3.75	0.60	Highly perceived
Item 410	I will donate blood for monetary rewards.	1.43	0.76	No perception at all
Item 411	I will donate blood for incentives (raffle tickets, movie passes, certificate, free food, etc.)	1.58	0.83	No perception at all
Item 412	On a scale of 1-4, how likely are you to donate blood after seeing a blood donation campaign, such as posters or TV ads?	2.71	0.91	Moderately perceived

Item 413	I will donate blood if there's an urgent call for blood posted on social media.	2.84	0.93	Moderately perceived
Item 414	I will donate blood because of the health benefits of donation.	2.77	0.98	Moderately perceived
Item 415	I will donate blood because I am aware of the advantages of blood donation brought about by the free tests (e.g., blood tests, HIV tests, etc.)	2.65	1.05	Moderately perceived
Item 416	I will donate blood because I am curious.	2.10	1.04	Slightly perceived
Item 417	I will donate blood because I have time to spare.	2.19	0.99	Slightly perceived
Item 418	I will donate blood because it feels good.	2.23	1.02	Slightly perceived
Item 419	I will donate blood because I have increased knowledge about blood donation.	3.03	0.93	Moderately perceived
Item 420	I will donate blood because I'm guilty that I am not regularly donating blood.	1.81	0.93	Slightly perceived

**Legend: 1.00-1.75 = No perception at all; 1.76-2.50 = Slightly perceived; 2.51-3.25 = Moderately perceived; 3.26-4.00 = Highly perceived*

Most respondents (110, 55%) reported no perception of deterring factors to blood donation, indicating that most do not view these factors as significant barriers. Item analysis in Table 4 shows that time constraints were the main deterrent, followed by health concerns, while fear of blood ranked lowest.

Table 4: Item Analysis on the Level of Perception of Deterring Factors of Voluntary Blood Donation among medical students

Item No.	Item	Weighted Mean	Standard Deviation	Interpretation*
Item 501	Time limitations due to work, studies, family responsibilities, and/or voluntary activities may hinder me from donating blood.	3.29	0.89	Highly perceived
Item 502	I will not donate blood because of fear.	1.68	0.98	No perception at all
Item 503	I will not donate blood because I am afraid of needles.	1.54	0.87	No perception at all
Item 504	I will not donate blood because I am afraid of blood.	1.30	0.66	No perception at all
Item 505	I will not donate blood because I am afraid of pain that could be felt while donating blood.	1.56	0.89	No perception at all
Item 506	I will not donate because I am afraid of fainting.	1.58	0.90	No perception at all
Item 507	I will not donate blood because of previous painful experiences during blood donation.	1.39	0.73	No perception at all
Item 508	I will not donate blood because it does not interest me for no particular reason.	1.50	0.78	No perception at all
Item 509	I will not donate blood as it does not interest me because I lack some information regarding the blood donation process.	1.36	0.66	No perception at all
Item 510	I will not donate due to health-related concerns such as pregnancy, acute fever, recent vaccination, recent medication intake, recent alcohol consumption, ear or body piercing and tattooing, and/or surgery.	2.24	1.23	Slightly perceived

Item 511	I will not donate blood because I am unsure if my health condition(s) will prevent me from donating blood.	2.10	1.07	Slightly perceived
Item 512	I will not donate blood because of the difficulty in accessing the blood service facility.	1.90	0.92	Slightly perceived
Item 513	I will not donate blood because there is no blood service facility in the area.	1.85	0.91	Slightly perceived
Item 514	I will not donate blood due to the behavior and/or poor treatment of staff towards the donors.	1.91	0.94	Slightly perceived
Item 515	I will not donate blood due to the strict restrictions and numerous requirements needed of blood donors.	1.70	0.90	No perception at all
Item 516	I will not donate blood because I often travel from one country/area to another which excludes me from donating blood.	1.67	0.86	No perception at all

**Legend: 1.00-1.75 = No perception at all; 1.76-2.50 = Slightly perceived; 2.51-3.25 = Moderately perceived; 3.26-4.00 = Highly perceived*

Non-donors outnumbered donors across most sociodemographic groups (Table 5). Older students (30+) had the highest donation rate (83.3%), followed by males (49.2%), married students (60%), higher-income students (53.8%), and those from health-related pre-med programs (33.3%). Roman Catholics formed the largest donor group, though other religions had the highest proportional rate (60%).

Table 5: Blood Donation Practice across the sociodemographic profile of medical students

Sociodemographic Profile		Blood Donation Practice (f, %)		
		Donors	Non-Donors	Total
Age	18-20 years old	1 (5.6%)	17 (94.4%)	18 (100.0%)
	21-23 years old	12 (38.7%)	19 (61.3%)	31 (100.0%)
	24-26 years old	42 (31.3%)	92 (68.7%)	134 (100.0%)
	27-29 years old	5 (45.5%)	6 (54.5%)	11 (100.0%)
	≥30 years old	5 (83.3%)	1 (16.7%)	6 (100.0%)
Sex	Female	35 (25.2%)	104 (74.8%)	139 (100.0%)
	Male	30 (49.2%)	31 (50.8%)	61 (100.0%)
Civil Status	Single	64 (32.3%)	134 (67.7%)	198 (100.0%)
	Married	1 (50.0%)	1 (50.0%)	2 (100.0%)
Monthly Family Income (in pesos)	Less than 10,957	1 (16.7%)	5 (83.3%)	6 (100.0%)
	10,957 to 21,914	---	5 (100.0%)	5 (100.0%)
	21,915 to 43,828	5 (45.5%)	6 (54.5%)	11 (100.0%)
	43,829 to 76,699	10 (33.3%)	20 (66.7%)	30 (100.0%)
	76,670 to 131,483	13 (36.1%)	23 (63.9%)	36 (100.0%)
	131,484 to 219,140	8 (24.2%)	25 (75.8%)	33 (100.0%)
	More than 219,140	28 (35.4%)	51 (64.6%)	79 (100.0%)
Religion	Roman Catholic	54 (32.9%)	110 (67.1%)	164 (100.0%)
	Christian Denomination	3 (21.4%)	11 (78.6%)	14 (100.0%)
	Muslim	3 (33.3%)	6 (66.7%)	9 (100.0%)
	Protestant	2 (25.0%)	6 (75.0%)	8 (100.0%)
	Others	3 (60.0%)	2 (40.0%)	5 (100.0%)
Pre-Medicine Course	Health-Related Course	63 (33.2%)	127 (66.8%)	190 (100.0%)
	Non-Health-Related Course	2 (20.0%)	8 (80.0%)	10 (100.0%)
Nationality	Filipino	63 (32.1%)	133 (67.9%)	196 (100.0%)
	Non-Filipino	2 (50.0%)	2 (50.0%)	4 (100.0%)

Perceived knowledge showed a weak but statistically significant association with blood donation among medical students (37.1%, $p=0.002$, $\phi=0.222$). However, most highly knowledgeable students did not donate. Motivation exhibited a weak, non-significant link to donation (20.8%–39.8%; $p=0.118$, $V=0.146$) with emotional and social drivers, such as altruism appearing more influential. Perceived deterrents were similarly weak and non-significant ($p=0.197$, $V=0.127$) with fears having less impact than enabling factors such as medical knowledge.

4. Discussion

The study investigated the factors influencing voluntary blood donation practices among medical students by understanding their perceived knowledge, motivating factors, and deterrent factors. Overall, the high perceived knowledge with favorable motivating factors and minimal deterring factors did not translate into regular blood donation behavior. Despite being knowledgeable, particularly on pre-donation health screenings, altruism was the main motivation to donate blood. Nevertheless, lack of time mostly hinders medical students from donating blood. The association indicates that knowledge and motivation alone may not be sufficient to promote voluntary blood donation among medical students. This study informs policymakers on the importance in addressing the motivational and deterring factors on blood donation for future healthcare workers.

Medical students are knowledgeable and consider themselves adequately informed about blood donation. These findings indicate that students are confident in existing safety protocols and in responsible donation practices. However, perceived knowledge may not always correspond to an accurate understanding of donor eligibility and procedures. Similar knowledge gaps, particularly regarding eligibility criteria, have been documented among health professional students in other countries (Mussema et al., 2024; Nannono et al., 2025). Although students in health-related fields generally demonstrate better knowledge and more positive attitudes, previous studies show that many are still unaware of basic requirements such as minimum age and weight limits (Eltewacy et al., 2024; Ratnakar et al., 2023). Additionally, most highly knowledgeable students did not donate, indicating other factors beyond knowledge may have a behavioral impact (Gebresilase et al., 2017; Kagoya et al., 2024; Murtagh & Katulamu, 2021). These gaps may reflect the misconceptions among the future healthcare professionals and the challenges in effectively educating the community and promoting voluntary blood donations.

Motivations were generally low to moderate and mostly driven by personal or altruistic reasons. Medical students are characteristically altruistic in nature and empathize to the needs of their patients. Similar to Athanasaki et al. (2025), medical students are academically exposed to cases that need blood transfusion and issues on blood shortages (Eltewacy et al., 2024; Mussema et al., 2024). Therefore, being physically and psychologically prepared for blood donation, they hold themselves morally and socially accountable in donating (Kagoya et al., 2024). Their decisions were not influenced by peer pressure but may have been contributed by encouragement from friends and their sense of social responsibility (Basavarajegowda et al., 2020). Comparable trends have been observed in other countries, where the primary motivation for donation was the desire to help family members or friends when the need arises (Eltewacy et al., 2024; Terzieva, 2021). Broader altruistic factors, such as civic and ethical responsibility alongside a sense of moral fulfillment for saving lives, were likewise noted among students globally (Kagoya et al., 2024; Masongsong, 2023; Naranja et al., 2021). The free medical tests performed prior to donating may have served as an opportunity for students to learn one's health status (i.e. HIV and Hepatitis B) (Kagoya et al., 2024). The results indicate that despite personal intentions being the main intrinsic drivers for the students to donate, some factors such as accessible and efficient services in donation facilities may have translated intentions into actual practice (Zaheer et al., 2023).

Donation practices may be hampered by time constraints due to overwhelming workloads both academically and clinically, long turnaround time in blood donation process, and lack of workforce assigned to the task (Bumanglag et al., 2020). These findings mirror local and global studies, where busyness or lack of direct invitation were key barriers (Alanazi et al., 2023; Mappala et al., 2023; Ratnakar et al., 2023). The medical students' knowledge of the blood donation processes may have been associated with high self-efficacy and ability to control their actions, particularly their fear of blood, needles, pain, and fainting. However, voluntary blood donation remained low

(Lakew et al., 2026). Similarly, in some contexts, health-related misinformation persists and mistrust in donation safety appears to be increasing (Kagoya et al., 2024; Naranja et al., 2021). The results may reflect weaknesses on blood donation processes and the value in enhancing accessibility, quality of service, and workforce in donation facilities.

Older students tended to donate more, likely due to maturity and social responsibility (Eltewacy et al., 2024; Kagoya et al., 2024; Sparrow et al., 2021; Thorpe et al., 2021), though some studies found no age effect (Zhang et al., 2021). Males donated more than females, reflecting physiological and sociocultural factors (Alkalash et al., 2024; Ashipala & Joel, 2023; Halawani, 2024), despite females' higher empathy (Çiftçi et al., 2021; France et al., 2022; Saud et al., 2021). Singles donated less, consistent with findings globally (Daneshi et al., 2021; Saeed et al., 2024; Siekierska et al., 2023), though other studies show no association (Li et al., 2021). Higher-income students donated more, possibly due to better access and flexibility (Jaffry et al., 2019; Zucoloto et al., 2019), though results are mixed (Alkalash et al., 2024; Mappala et al., 2023). Despite church drives, Roman Catholics donated less, suggesting motivation outweighs charitable causes associated with affiliations (Valera et al., 2019; Zucoloto et al., 2020). However, tailored faith-based campaigns may also help (Avera, 2023). Health-related students donated more, likely due to greater exposure (Eltewacy et al., 2024; Mussema et al., 2024), but knowledge may co-occur with supportive opportunities and culture. Lower rates among Filipino students compared to non-Filipinos reflect cultural and systemic influences (Fung et al., 2023), underscoring the value of localized, culturally sensitive strategies (Antonio, 2023; Avera, 2023).

As future healthcare professionals, knowledge and good motives to donate blood may not be sufficient to address the global shortages of blood supply, but through the actual practice of donating blood, which is contributed largely by the potential young advocates. The results reveal the intention-behavior gap that shows knowledge and good intentions may not always translate into action due to environmental factors (Conner & Norman, 2022). The study may have denoted a systemic and organizational weakness in the blood donation process and facilities rather than personal intentions. Targeted education may benefit in aligning confidence with accurate and comprehensive understanding, promoting a proactive and consistent donor behavior (Antonio, 2023). Strengthening both interpersonal and community-level motivators by improving accessibility through mobile blood drives directly to the community and institutions with extended operational hours, short turnaround time, efficient and quality service may facilitate an increase in voluntary blood donation rates and encourage repeat donors (Antonio, 2023; Bumanglag et al., 2020). Establishing external linkages and organizing well-promoted campus blood drives may be more effective in increasing participation than awareness campaigns alone (Antonio, 2023; Viwattanakulvanid & Oo, 2021).

This study acknowledges several limitations. The reliance on self-reported data through survey questionnaires may introduce the potential for response bias, as respondents may overestimate or underestimate their knowledge, motivations, or perceived barriers. The findings may have limited generalizability due to its confinement to a single institution, thereby restricting the applicability of results to medical students from other universities or geographic locations. External variables such as individual health conditions or the influence of public health campaigns were beyond the researchers' control. It may have impacted respondents' attitudes or behaviors related to blood donation. While these limitations were considered in the analysis and interpretation, they may nonetheless affect the depth and generalizability of the study findings.

5. Conclusion

This study showed that medical students are generally knowledgeable, particularly about donor screening, and altruistically driven. However, potential weaknesses particularly regarding time constraints may hinder blood donation practices. This indicates that voluntary blood donation is associated with factors beyond knowledge and personal intentions, which include accessibility and quality of service in blood donation facilities. This study reveals a potential intention-behavior gap and informs policy makers in developing tailored approach strategies encouraging voluntary blood donation and donation repeats, ensuring adequate blood supply available for the community's health needs. Furthermore, future studies should focus on monitoring donation patterns over time,

evaluating peer-led interventions, and identifying key motivators and barriers to guide the development of targeted and scalable strategies that guarantees safe and adequate blood supply.

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