

MYTHS AND MISCONCEPTIONS REGARDING BLOOD DONATION AMONG NURSING STUDENTS IN PUBLIC SECTOR NURSING COLLEGES IN PESHAWAR, PAKISTAN

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Abstract

Background: Pakistan needs more than five million blood donations a year but collects about 2.3 million, and roughly 82% of these come from family or replacement donors. Nursing students are future health educators, and the beliefs they hold about blood donation may shape both their own donation and the advice they give to patients and families

Objectives: To assess common myths and misconceptions about blood donation among nursing students in public-sector nursing colleges of Peshawar, to evaluate their knowledge and awareness of blood donation, and to examine whether these beliefs are related to having donated blood.

Methods: A quantitative, descriptive cross-sectional study was carried out from June to October 2026 in four public-sector nursing colleges in Peshawar. Using convenience sampling, 292 students (73 per college) completed an adopted and modified questionnaire with sections on demographics, myths and misconceptions (9 items), fears and anxiety (6 items), and knowledge (7 items), each rated on a five-point Likert scale. Data were analysed in SPSS version 27 using descriptive statistics, reliability analysis, independent-samples t tests, Mann-Whitney U tests, chi-square tests, binary logistic regression, correlation, hierarchical linear regression, and one-way ANOVA with Welch and Kruskal-Wallis checks.

Results: Most respondents were female (89.4%) and aged 18–20 years (67.8%); only 16.3% had ever donated blood and 38.1% had attended an awareness session. The most widely endorsed misconceptions were that blood banks profit by selling donated blood (61.5%), that donors risk blood-borne infection (53.1%), and that donation makes most donors faint (46.2%). The mean myths score was 2.55 (SD = 0.65) on a 1–5 scale; 60.3% of students fell in the moderate range and 7.9% in the high range. Self-rated knowledge was high (M = 3.87, SD = 0.57), with 72.6% scoring in the high band, although only 60.3% claimed familiarity with donor eligibility criteria. Donors and non-donors did not differ on myths ($t(287) = -1.22$, $p = .224$), fear, or knowledge, and none of the three scores predicted donor status in logistic regression ($\chi^2(3) = 2.04$, $p = .564$). Myths were unrelated to knowledge ($r = -.01$, $p = .845$) but moderately correlated with fear ($r = .37$,

$p < .001$). Female students held more myths than male students ($p < .001$), and myth and fear scores differed across colleges and by main source of information, with the lowest scores among students who relied on health professionals.

Conclusion: Nursing students in Peshawar rated their knowledge of blood donation highly, yet about two thirds held at least a moderate level of misconceptions, and these beliefs sat alongside, rather than in place of, their knowledge. Donation experience was low and was not explained by the measured beliefs. Teaching that targets specific misconceptions about infection risk, fainting, and the handling of donated blood, delivered by health professionals and linked to supervised donation opportunities, is recommended.

1. INTRODUCTION

1.1 Background of the Study

Blood transfusion supports the treatment of trauma, major surgery, obstetric haemorrhage, severe anaemia, cancer, and inherited blood disorders such as thalassaemia. None of these services can run without a steady and safe supply of donated blood, and that supply depends on members of the public who are willing to give it. Access, however, is uneven. The World Health Organization (WHO, 2025) reports that about 118.5 million donations are collected worldwide each year, 40% of them in high-income countries that hold 16% of the world's population. The median donation rate is 31.5 per 1,000 people in high-income countries, compared with 6.6 per 1,000 in lower-middle-income countries and 5.0 per 1,000 in low-income countries.

Pakistan sits on the wrong side of this gap. Its hospitals need more than five million donations a year and are projected to need 5.6 million by 2030, but they receive about 2.3 million (World Health Organization Regional Office for the Eastern Mediterranean [WHO EMRO], 2025). Roughly 82% of those donations come from family or replacement donors, and only 18% from voluntary, unpaid donors (WHO EMRO, 2025). This reliance matters for safety as well as volume. A systematic review of Pakistani studies found that voluntary non-remunerated donations made up less than 13% of collections and that hepatitis B and C markers were far more common in replacement donors (4.15%) than in voluntary donors (0.48%) (Ehsan et al., 2020). A shift towards regular voluntary donation is therefore a patient-safety goal and not only a supply target.

Young adults are the obvious group to recruit. They are usually healthy, they are concentrated in colleges and universities where donation drives can be organised, and a person who starts donating early can give for decades. Yet studies of students in Pakistan and elsewhere keep finding the same obstacles: fear of needles, worry about infection, the belief that donation leaves a person weak or anaemic, and uncertainty about who is eligible. Among 411 future healthcare workers in Rawalpindi, non-donors most often feared harm to their general health (42.3%) or infection (12.7%), while those who had donated reported dizziness and weakness afterwards (Arshad et al., 2024). A survey of 1,232 undergraduates in Peshawar identified fear of needles, fear of infection, and perceived medical unfitness as the main barriers (Zahir et al., 2024), and misconceptions about eligibility and health effects persisted among university students in Rawalpindi despite generally positive attitudes (Sohail et al., 2025).

Being a health-science student does not remove these beliefs. In a 16-country survey of 12,606 university students, those in health-science colleges knew more about donation than other students, but their actual donation rates were no higher, and fear of pain or infection, concern about health effects, and doubts about eligibility were reported across disciplines (Eltewacy et al., 2024). Nursing students in Spain and Portugal scored a mean of 3.1 out of 10 on a blood-donation knowledge test, a result the authors described as lower than expected for the profession (Martínez-Santos et al., 2021).

Nursing students deserve particular attention. Nurses spend more time with patients and families than most other health workers, they are often the ones asked whether donating is safe,

and they staff the wards and blood banks where donors are screened and bled. A student nurse who believes that donation causes chronic anaemia or exposes the donor to HIV is unlikely to donate, and is also likely to pass that belief on. Evidence from Lahore shows that structured teaching can raise students' knowledge and their stated willingness to donate (Saqlain et al., 2024), which suggests that misconceptions in this group can be corrected once they are identified. This study sets out to identify them among nursing students in the public-sector colleges of Peshawar.

1.2 Problem Statement

Pakistan depends heavily on replacement donors, and the young people who could form a stable voluntary donor base often hold beliefs that discourage donation. Studies in Rawalpindi and Peshawar have described these beliefs among medical and general university students (Arshad et al., 2024; Sohail et al., 2025; Zahir et al., 2024), but they have not examined nursing students in the province's public-sector nursing colleges as a group. It is not known which specific misconceptions are most common among these students, how confident they are in their knowledge of donation, or whether their beliefs are connected with whether they have donated. Without this information, nursing colleges cannot design teaching that addresses the misconceptions their own students actually hold.

1.3 Significance of the Study

The study has practical value for three groups. For nursing colleges, an item-by-item picture of which statements students accept can guide the content of lectures and awareness sessions, so that teaching time is spent on the beliefs that are widespread rather than on those that few students hold. For blood banks and transfusion services in Peshawar, the findings indicate which concerns need to be answered when nursing students are approached as potential voluntary donors. For the students themselves, and through them their future patients, correcting misconceptions during training may improve the accuracy of the advice they give. The study also adds local data from Khyber Pakhtunkhwa to a literature on student blood donation that has been drawn largely from other regions.

1.4 Research Objectives

1. To assess the common myths and misconceptions regarding blood donation among nursing students in public-sector nursing colleges of Peshawar.
2. To evaluate the students' awareness and knowledge regarding blood donation and its importance in saving lives.

1.5 Research Questions

1. What is the level of awareness and knowledge regarding blood donation among nursing students in Peshawar?
2. Which myths and misconceptions about blood donation are most common among these nursing students?
3. Is there a relationship between blood donation and myths and misconceptions?

1.6 Operational Definition.

Myths. Commonly held beliefs about blood donation that people accept without scientific evidence. In this study, myths were measured by the nine statements in Section B of the questionnaire (for example, "Regular blood donation leads to chronic anemia in healthy individuals").

Misconceptions. Incorrect ideas or misunderstandings about blood donation that arise from a lack of knowledge or from wrong information. Myths and misconceptions were scored together as a single construct, and agreement (a response of "agree" or "strongly agree") with a Section B statement was taken as endorsement of the misconception.

Fear and anxiety related to blood donation. Self-reported apprehension about the needle, the sight of blood, weakness, dizziness, screening results, or complications, measured by the six statements in Section C.

Knowledge or awareness. The student's self-rated awareness of facts about blood donation, including its safety, eligibility criteria, screening of donated blood, replacement of lost blood, component separation, the interval between donations, and pre- and post-donation care, measured by the seven statements in Section D.

Nursing student. A student aged 18 years or above enrolled in a nursing degree programme

at one of the four selected public-sector nursing colleges in Peshawar at the time of data collection.

Blood donation status. Whether the student reported having ever donated blood (yes or no).

1.7 Variables of the Study

Following the proposal, myths and misconceptions regarding blood donation were treated as the independent variable, and knowledge or awareness regarding blood donation, together with the willingness to donate as reflected in having donated, as the dependent variables. Fear and anxiety were measured as a related construct, and the demographic characteristics in Section A (age, gender, marital status, year of study, residence, blood group, attendance at an awareness session, main source of information, and college) were used to describe the sample and to compare scores between groups.

1.8 Scope and Delimitations

The study was limited to students of four public-sector nursing colleges in Peshawar. Students of private nursing colleges and Post-RN programmes were not included, and the findings should not be extended to them without caution. The study measured beliefs, fears, and self-rated knowledge at a single point in time; it did not test students' factual knowledge with right-or-wrong questions, and it did not follow students to see whether they later donated.

1.9 Organisation of the Report

Chapter 2 reviews recent literature on blood supply, student donation, the misconceptions and fears that deter donors, and the role of knowledge, and it presents the conceptual framework. Chapter 3 describes the design, setting, sample, instrument, data collection, and analysis. Chapter 4 reports the results in tables and figures, each followed by its interpretation. Chapter 5 discusses the findings against earlier studies and closes with conclusions, recommendations, and limitations.

2. LITERATURE REVIEW

2.1 Introduction

This chapter reviews studies published between 2020 and 2025 that bear on the research questions. Sources were identified mainly

through PubMed using combinations of the terms blood donation, knowledge, attitude, practice, myths, misconceptions, fear, students, nursing, vasovagal reaction, and Pakistan, and were supplemented by WHO documents. The review first describes the supply problem, then turns to students as donors, the specific misconceptions and fears measured in this study, the knowledge gaps reported among health-science students, and the evidence on changing these beliefs.

2.2 Global and National Blood Supply

WHO's global status report, based on data up to 2018, documented persistent differences in collection between income groups and a continued dependence on family, replacement, or paid donors in many low- and middle-income countries (World Health Organization [WHO], 2022). The current fact sheet gives a median donation rate of 31.5 per 1,000 population in high-income countries against 6.6 per 1,000 in lower-middle-income countries, the group to which Pakistan belongs (WHO, 2025).

In Pakistan the shortfall is large. The country collects around 2.3 million donations a year against a need of more than five million, and about 1.9 million of those donations come from family or replacement donors (WHO EMRO, 2025). The transfusion system has been described as fragmented and demand-driven, with repeated collections from replacement donors, incomplete screening for syphilis and malaria in some centres, and a donor population that is almost entirely male (Ehsan et al., 2020). Replacement donation places the burden of finding blood on the patient's family at the moment of crisis, and the review's finding of higher hepatitis prevalence among replacement donors shows why WHO continues to press for voluntary, repeat donation.

2.3 Students as Potential Voluntary Donors

Across countries, most students say they value blood donation, but few of them donate. Among 12,606 university students in 16 countries, 28.5% had a good level of knowledge and 22.7% had ever donated; being female, having a chronic illness, and having low knowledge were each associated with lower odds of donation (Eltewacy et al., 2024). The same pattern of favourable attitudes and low practice

has been reported among undergraduates in Ethiopia, where 77.6% had adequate knowledge but only 19.3% had donated (Mussema et al., 2024), among health-science college students in northeast Ethiopia, where the lifetime donation rate was 12.4% (Dejene et al., 2021), and among medical students in Gaza, 83.3% of whom had never donated (Alsarafandi et al., 2023). Rates are higher in some settings: 39.4% of medical students at a Ugandan university (Kagoya et al., 2024), 40.8% of students at Wollega University (Shama et al., 2022), and 48.8% of health-profession students in northern Uganda (Nannono et al., 2025) had donated.

Gender recurs as a strong correlate. Male students in Bangladesh were 7.28 times more likely than female students to have donated voluntarily (Bhuiyea et al., 2022), and male students in Saudi Arabia were more likely to donate than female students (Kuriri, 2024). Female students, by contrast, often score higher on knowledge. Among 601 medical-science students in Jazan, female students and previous donors gave more accurate answers to knowledge and attitude questions (Halawani, 2024), and female undergraduate medical students in Azad Kashmir had higher overall knowledge than their male peers (Javaeed et al., 2020). This split between knowing and doing is relevant to nursing colleges in Peshawar, where most students are women.

Structural equation modelling of 5,168 students in Wuhan offers one explanation for why knowledge alone does not lead to donation. Knowledge had a total effect of 0.321 on donation behaviour, but much of this operated through attitude, which had the largest effect (0.389) (Ma et al., 2024). Knowledge, in other words, appears to matter for donation mainly when it changes how students feel about donating. The theory of planned behaviour (TPB) points in the same direction. A meta-analysis of 117 samples covering donations of blood, organs, time, and money found that perceived behavioural control, moral norm, attitude, and subjective norm were all moderately to strongly associated with intention to donate, and that intention in turn predicted later behaviour (White et al., 2023). Misconceptions and fears are likely to act on the attitude and perceived-control components of this model.

2.4 Myths and Misconceptions About Blood Donation

2.4.1 *Harm to the Donor's Health*

The belief that donation damages the donor's health is the most frequently reported misconception. In Rawalpindi, concern about general health was the leading fear of non-donors (Arshad et al., 2024). Among students and teachers of religious institutions in Bangladesh, 21% did not donate because they thought it was harmful to health (Hossain et al., 2022), and concern about negative health effects was cited by 18% of the multinational student sample (Eltewacy et al., 2024). A cluster analysis of 312 university students in India found a group whose reluctance centred on myths about health impacts, separate from groups driven by needle fear or lack of information (Thusoo & Mishra, 2025).

Part of this belief has a factual basis that has been exaggerated. Whole-blood donation does remove iron, and frequent donation can lead to iron deficiency, which is why blood services in Europe screen haemoglobin, set minimum intervals, and in some countries give iron supplements or use ferritin-guided intervals (van den Hurk et al., 2024). These measures are designed to keep eligible donors safe. The step from "donation removes iron" to "donation causes chronic anaemia" or "permanent weakness" is where the misconception lies, and a rapid review of iron-management strategies concluded that blood services still need better ways of informing donors about donation-related iron loss and how it is managed (Thijssen et al., 2024).

2.4.2 *Risk of Infection*

Fear of acquiring HIV or hepatitis through donation appears in most studies of barriers. It was named by 12.7% of non-donors in Rawalpindi (Arshad et al., 2024) and grouped with fear of pain by 18% of the multinational sample (Eltewacy et al., 2024). In Peshawar, fear of infection was one of the three main barriers identified among undergraduates (Zahir et al., 2024). For the donor, sterile single-use collection equipment removes this risk. The confusion may arise because transfusion-transmissible infections are a real risk for recipients in Pakistan, where screening and donor selection remain uneven (Ehsan et al., 2020), and

students may not distinguish between the safety of giving blood and the safety of receiving it.

2.4.3 Fainting, Pain, and Weakness

Vasovagal reactions (VVRs), which range from light-headedness to fainting, are the most common adverse event of donation, but they affect a small fraction of donations. Italian haemovigilance data recorded 25.0 VVRs per 10,000 donations between 2016 and 2019, with higher rates in first-time and younger donors (Piccinini et al., 2022), and regional data from Chongqing reported 8.69 VVRs per 1,000 whole-blood donations, with students and young first-time donors at higher risk (Li et al., 2024). Self-reported rates are higher: in an online survey of German donors, 17% reported a vasovagal reaction without loss of consciousness and 2% with it (Orru' et al., 2021). A meta-analysis of 71 studies confirmed female sex, first-time donation, younger age, smaller blood volume, and lower blood pressure as risk factors, and found that fear, anxiety, and disgust about donation were also associated with higher risk (Wu et al., 2025). Among 442 first-time Australian donors, feeling scared or fearful before donation nearly doubled the odds of a reaction (Thijssen et al., 2023). The belief that most donors faint is therefore wrong, but the fear of fainting is not harmless, because it can itself contribute to reactions.

2.4.4 Gender, Religion, and the Handling of Donated Blood

Other misconceptions concern who may donate and what happens to the blood. Women are less likely than men to have donated (Eltewacy et al., 2024; Kuriri, 2024), and a pattern of this kind can harden into the belief that women are unfit to donate at all. Religious objections are occasionally raised, but in Muslim settings religion usually supports donation: more than 80% of respondents in Bangladeshi religious institutions regarded donation as a moral responsibility and an Islamic act, and those who held this view were about twice as likely to be regular donors (Hossain et al., 2022). Among theology students in Turkey, attitudes to blood donation were positive, while religious concerns weighed more heavily on organ donation (Öcal et al., 2025), and in Brazil lower religiosity was observed among male students who had never

donated (Zucoloto et al., 2020). Distrust of blood banks is also reported; medical mistrust deterred 14% of the multinational student sample (Eltewacy et al., 2024), and mistrust appears among the barriers summarised in a Saudi systematic review (Alanazi et al., 2023).

2.5 Fear and Anxiety as Barriers

Fear of needles is the barrier most often reported by students. It was the most common potential barrier among 1,000 students in Serbia (41.4%) (Kocic et al., 2024) and among the leading reasons for non-donation in Bangladesh (Hossain et al., 2022) and Peshawar (Zahir et al., 2024). Reviews of donation in the Caribbean list fear of needles and of adverse reactions alongside presumed ineligibility and never having been asked (Reid et al., 2025). Fear also shapes experience once a person donates: dizziness, weakness, and aches were the most common symptoms reported by donors in Rawalpindi (Arshad et al., 2024). Physical counter-pressure manoeuvres, such as leg crossing and muscle tensing, have been shown to raise standing blood pressure and to reduce symptoms in a majority of users, including in studies conducted during blood donation (Williams et al., 2022), which suggests that fear of fainting can be addressed with practical instruction as well as reassurance.

2.6 Knowledge of Blood Donation Among Health-Science Students

Knowledge levels among health-science students vary widely with how knowledge is measured. Using self-rated or broad questions, 73% of health-profession students in northern Uganda (Nannono et al., 2025) and 69.3% of health-science college students in southwest Ethiopia (Yosef et al., 2021) were classed as having adequate or good knowledge, and 99.7% of Syrian medical students scored high (Salem et al., 2024). Specific factual tests produce lower figures. Nursing students in Spain and Portugal averaged 3.1 out of 10 (Martínez-Santos et al., 2021), and Spanish health-science students scored a median of 5 out of 10 (Martínez-Santos et al., 2022). The weakest areas are usually eligibility rules and donation intervals: 68.1% of medical students in Gaza did not know the waiting time between whole-blood donations, and only 30.7% and 25.2% knew the minimum

age and weight (Alsarafandi et al., 2023). Knowledge gaps on eligibility were also prominent among young Saudi adults (Kuriri, 2024).

Where knowledge has been linked to practice, the association is usually positive. Knowledge of blood donation was associated with donation among Ethiopian health-science students (adjusted odds ratio [AOR] = 2.09) (Dejene et al., 2021) and Wollega University students (AOR = 2.04) (Shama et al., 2022), and previous donation was associated with good knowledge in southwest Ethiopia (Yosef et al., 2021). Regular donors in Serbia answered 84.3% of knowledge questions correctly compared with 59.2% among non-donors (Kocic et al., 2024). The direction of these associations is open: knowledge may lead to donation, or donating may teach people about the process.

2.7 Correcting Misconceptions Through Education

Several studies suggest that misconceptions among health-science students respond to targeted teaching. In Lahore, small-group discussions, video lectures, and demonstrations raised the proportion of allied health students with good knowledge from 81.8% to 94.9%, and willingness to donate rose from 46.4% to 92.9% (Saqlain et al., 2024). A positive-deviance

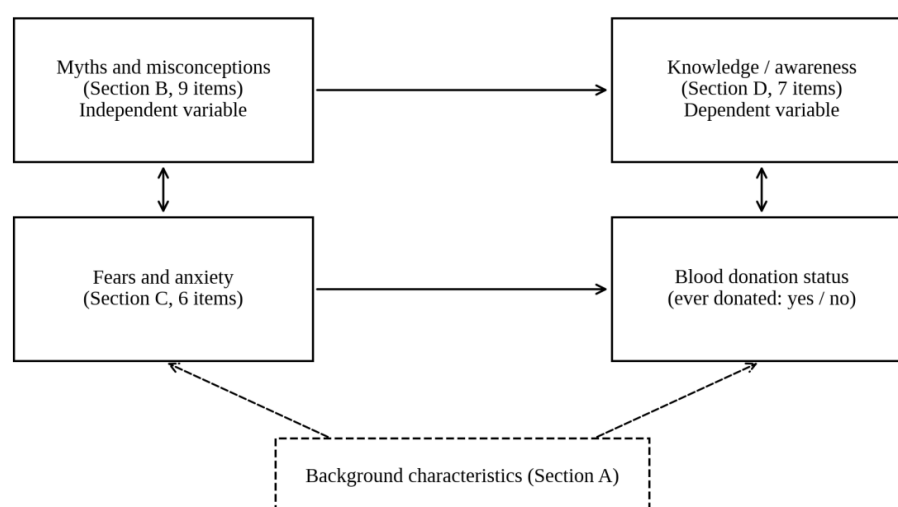
approach in India, in which students who had donated shared their experience with peers, increased willingness to donate from about 10% to 66% (Mohan et al., 2024). In Egypt, an education programme on haematopoietic stem cell donation reduced the share of nursing students with high myth scores from 90% to 4% (Khaled et al., 2023). The source of information also appears to matter: students in Bangladesh who had seen social-media campaigns were more likely to donate (Bhuiyea et al., 2022), and in Gaza most students had received their information at school (Alsarafandi et al., 2023).

2.8 Conceptual Framework

The framework for this study (Figure 2.1) follows the proposal. Myths and misconceptions are the independent variable, and knowledge or awareness is the dependent variable. Fear and anxiety are placed alongside myths, since the literature reviewed above treats them as closely linked but distinct barriers. Blood donation status is included as a second outcome to answer the third research question, and background characteristics are shown as factors that may influence all four constructs. Drawing on the TPB (White et al., 2023), myths and fears are expected to reduce donation by making it seem harmful or frightening, while knowledge is expected to counter them

Figure 2.1

Conceptual Framework of the Study



Note. Solid arrows show the relationships examined; the dashed box and arrows show background characteristics used for description and group comparison.

2.9 Research Gap

Pakistani studies of blood donation beliefs have concentrated on medical students and mixed university samples in Rawalpindi, Lahore, Azad Kashmir, and Peshawar (Arshad et al., 2024; Javaeed et al., 2020; Saqlain et al., 2024; Sohail et al., 2025; Zahir et al., 2024). None of the studies located for this review examined nursing students in the public-sector nursing colleges of Peshawar, reported which individual misconceptions they endorse, or tested whether those misconceptions relate to their knowledge and donation history. The present study addresses this gap.

3. RESEARCH METHODOLOGY

3.1 Research Design

A quantitative, descriptive cross-sectional design was used. Data on myths, fears, knowledge, and donation history were collected once from each participant with a structured, self-administered questionnaire. The design suits the objectives, which ask what students believe and know and whether these beliefs are associated with having donated; it does not allow conclusions about cause and effect.

3.2 Study Setting

The study was conducted in four public-sector nursing colleges in Peshawar, Khyber Pakhtunkhwa: the Government College of Nursing at Lady Reading Hospital (LRH), the Post Graduate College of Nursing (PGCN), the Government College of Nursing at Khyber Teaching Hospital (KTH), and the Government College of Nursing at Hayatabad Medical Complex (HMC). The three hospital-based

colleges are attached to major teaching hospitals of the city, so their students take clinical placements in settings where transfusion is routine.

3.3 Study Duration

The study took 14 weeks, from 25 June 2026 to 1 October 2026. This period covered administrative approvals, data collection, data entry and analysis, and report writing.

3.4 Study Population

The target population was students enrolled in nursing degree programmes at the four colleges. The combined enrolment of eligible students at the time of the study was estimated at 1,200.

3.5 Sample Size

The sample size was calculated with the Raosoft online sample size calculator, using a population of 1,200, a 95% confidence level, a 5% margin of error, and a 50% response distribution. The 50% distribution gives the largest required sample when the true proportion is unknown. The calculation gave a minimum sample of 292 students, and 292 completed questionnaires were obtained.

3.6 Sampling Technique

A non-probability convenience sampling technique was used. To give each college equal weight, 73 students were recruited from each of the four colleges (Table 3.1). Within each college, students who were present during data collection, met the inclusion criteria, and agreed to take part were enrolled until the college quota was reached.

Table 3.1

Distribution of the Sample Across the Four Nursing Colleges

Nursing college	Attached hospital	n	%
Government College of Nursing	Lady Reading Hospital (LRH)	73	25.0
Post Graduate College of Nursing (PGCN)	—	73	25.0
Government College of Nursing	Khyber Teaching Hospital (KTH)	73	25.0
Government College of Nursing	Hayatabad Medical Complex (HMC)	73	25.0
Total		292	100.0

3.7 Sample Selection Criteria

3.7.1 Inclusion Criteria

- Nursing students enrolled in the selected public-sector nursing colleges of Peshawar.
- Students present at the time of data collection.
- Students aged 18 years or above.
- Students who gave written informed consent.

3.7.2 Exclusion Criteria

- Students of private nursing colleges.
- Students of Post-RN programmes.

- Students with a known cognitive impairment that would prevent them from completing the questionnaire.

3.8 Data Collection Instrument

An adopted questionnaire was used after slight modification to suit the local context. It opened with an informed-consent form and contained four sections (Table 3.2). Section A recorded demographic information. Sections B, C, and D contained 22 statements in total, each rated on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

Table 3.2

Structure and Scoring of the Questionnaire

Section	Content	Items	Response format	Score range
A	Demographic information: age, gender, marital status, year of study, ever donated blood, residence, blood group, awareness session, primary information source, college	10	Categorical	—
B	Myths and misconceptions (M1–M9)	9	Likert 1–5	9–45
C	Fears and anxiety related to blood donation (F1–F6)	6	Likert 1–5	6–30
D	Knowledge regarding blood donation (K1–K7)	7	Likert 1–5	7–35

Note. Higher scores indicate stronger endorsement of myths, greater fear, and higher self-rated knowledge, respectively.

3.8.1 Scoring

For each of Sections B, C, and D a mean score was calculated as the average of the item responses, so that each scale runs from 1 to 5 regardless of the number of items. A mean was computed when no more than one item in the section was missing. Total scores (mean multiplied by the number of items) and percentage-of-maximum scores, calculated as $(\text{mean} - 1) \div 4 \times 100$, are also reported. Mean scores were classified into three levels using equal intervals across the 1–5 range: low (1.00–2.33), moderate (2.34–3.66), and high (3.67–5.00). For each statement, the percentage of students who selected "agree" or "strongly agree" was calculated as the endorsement rate, and statements were ranked by this rate.

3.8.2 Reliability of the Instrument

Internal consistency was assessed with Cronbach's alpha on the final data (Table 3.3). The myths and fear scales reached the conventional threshold of .70, and the knowledge scale was slightly below it at .675. For the myths scale, item M1 (blood banks profit by selling donated blood) had a weak corrected item-total correlation (.142), and removing it would have raised alpha to .764. The item was retained because it measures a belief that the proposal specifically set out to examine, but it appears to tap distrust of institutions more than beliefs about the physical effects of donation, and this is considered in Chapter 5.

Table 3.3*Internal Consistency of the Questionnaire Scales (Cronbach's Alpha)*

Scale	Items	Valid n	α	Range of corrected item-total r	α if weakest item deleted
Myths and misconceptions	9	290	.742	.142 – .620	.764 (M1)
Fear and anxiety	6	290	.731	.294 – .530	.735 (F6)
Knowledge / awareness	7	291	.675	.278 – .446	.666 (K7)

3.9 Data Collection Procedure

After permission was obtained from the heads of the four colleges, the researchers approached eligible students in each college during the data collection period. The purpose of the study was explained, the consent form was signed, and the questionnaire was completed by the students themselves. Completed questionnaires were checked for completeness, numbered, and stored securely until data entry.

3.10 Data Entry and Cleaning

Responses were entered in Microsoft Excel and imported into SPSS. Before analysis, every variable was checked for codes that fell outside

the questionnaire's response options (Table 3.4). Five respondents had one out-of-range Likert value each, apparently keying errors such as 33 or 24 in place of a single digit, and a small number of demographic entries carried codes that did not exist on the questionnaire. These values were set to missing rather than guessed. Because each affected respondent lost at most one item per scale, all 292 respondents retained valid composite scores. Age had been grouped into three bands at data entry (18–20, 21–23, and 24 years or above), and these bands were used in the analysis.

Table 3.4*Out-of-Range Codes Identified and Set to Missing During Data Cleaning*

Variable	Invalid code(s) found	Cases affected
Myth item M1	33	1
Myth item M4	24	1
Fear item F1	24	1
Fear item F2	23	1
Knowledge item K7	6	1
Marital status	3, 4	2
Year of study	9	1
Ever donated blood	3, 4	3
Residence	3	1
Awareness session attended	3	1
Primary information source	6	4

3.11 Data Analysis

Data were analysed with IBM SPSS Statistics version 27 (IBM Corp., 2020). Categorical variables were summarised as frequencies and percentages, using valid percentages where data were missing, and scale scores as means and standard deviations. Normality of the three composite scores was examined with the

Kolmogorov-Smirnov and Shapiro-Wilk tests, skewness and kurtosis, and Q-Q plots. Because the formal tests rejected normality in this large sample while skewness and kurtosis stayed within ± 2 , parametric tests were used as the primary analysis and each was repeated with its non-parametric counterpart

The analyses were matched to the research questions as follows. Research questions 1 and 2 were answered with item distributions, mean scores, endorsement rates, and score levels. For research question 3, donors and non-donors were compared on the three scores with independent-samples *t* tests and Mann-Whitney *U* tests, score levels were cross-tabulated against donor status with the chi-square test and Cramér's *V*, and a binary logistic regression entered the three scores together as predictors of having donated. The relationship between myths (independent variable) and knowledge (dependent variable) proposed in the study variables was examined with Pearson and Spearman correlations and a two-step hierarchical linear regression, with myths entered first and fear added second. Scores were also compared across demographic groups with independent-samples *t* tests and Mann-Whitney *U* tests for two-group variables, and one-way ANOVA with Tukey post hoc tests, Welch's test and Games-Howell post hoc tests where variances were unequal, and Kruskal-Wallis tests for variables with more than two groups. Statistical significance was set at $p < .05$ (two-tailed).

3.12 Ethical Considerations

Permission to conduct the study was obtained from the institutional authority of NICE

College of Nursing and Allied Health Sciences and from the heads of the participating colleges (Ref. No. _____). Written informed consent was taken from every participant after the purpose of the study had been explained. Participation was voluntary, and students were told that they could withdraw at any point without any effect on their studies. The questionnaire did not ask for identifying information other than an optional name on the consent form, which was stored separately from the responses. Data were kept securely and used only for this research.

4.RESULTS

4.1 Introduction

This chapter presents the results for the 292 nursing students who completed the questionnaire. It begins with the demographic profile, then reports the findings on myths and misconceptions (Objective 1, Research Question 2), fears, and knowledge (Objective 2, Research Question 1). It then examines the relationship between donation status and the three scores (Research Question 3), the proposed relationship between myths and knowledge, and differences between demographic groups. Percentages are valid percentages, so denominators vary slightly where responses were missing. Each table and figure is followed by its interpretation

4.2 Demographic Characteristics of the Respondents

Table 4.1

Demographic Characteristics of the Respondents (N = 292)

Characteristic	Category	n	%
Age group	18–20 years	198	67.8
	21–23 years	92	31.5
	24 years and above	2	0.7
Gender	Male	31	10.6
	Female	261	89.4
Marital status (n = 290)	Single	272	93.8
	Married	18	6.2
Year of study (n = 291)	1st year	41	14.1
	2nd year	72	24.7
	3rd year	127	43.6
	4th year	51	17.5

Characteristic	Category	n	%
Ever donated blood (n = 289)	Yes	47	16.3
	No	242	83.7
Residence (n = 291)	Urban	158	54.3
	Rural	133	45.7
Attended awareness session (n = 291)	Yes	111	38.1
	No	180	61.9
Primary information source (n = 288)	Teachers/faculty	119	41.3
	Social media	68	23.6
	Health professionals	62	21.5
	Friends/peers	28	9.7
	Television	11	3.8

Note. Blood group distribution is shown in Figure 4.3; college distribution is shown in Table 3.1.

The sample was young and mostly female (Table 4.1). Two thirds of students (67.8%) were aged 18–20 years, and only two were 24 or older. Women made up 89.4% of respondents and almost all students (93.8%) were single. Residence was split fairly evenly between urban (54.3%) and rural (45.7%) backgrounds. Only

47 students (16.3%) had ever donated blood, and fewer than four in ten (38.1%) had attended an awareness session on donation. Teachers and faculty were the most common source of information, named by 41.3%, followed by social media (23.6%) and health professionals (21.5%).

Figure 4.1

Distribution of Respondents by Year of Study

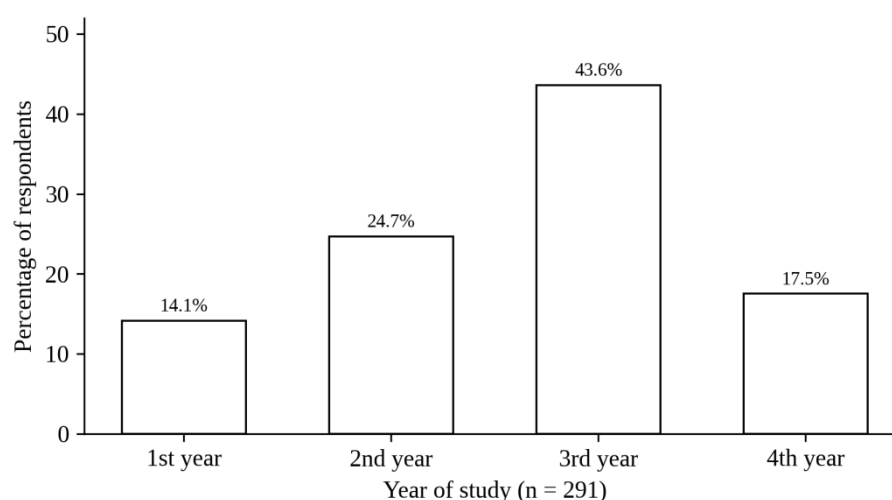


Figure 4.1 shows that third-year students formed the largest group (43.6%), followed by second-year (24.7%), fourth-year (17.5%), and first-year students (14.1%). The sample is therefore weighted towards students who had completed

at least one year of clinical training, which should be kept in mind when interpreting their knowledge scores: most respondents had already studied haematology and transfusion-related content to some extent.

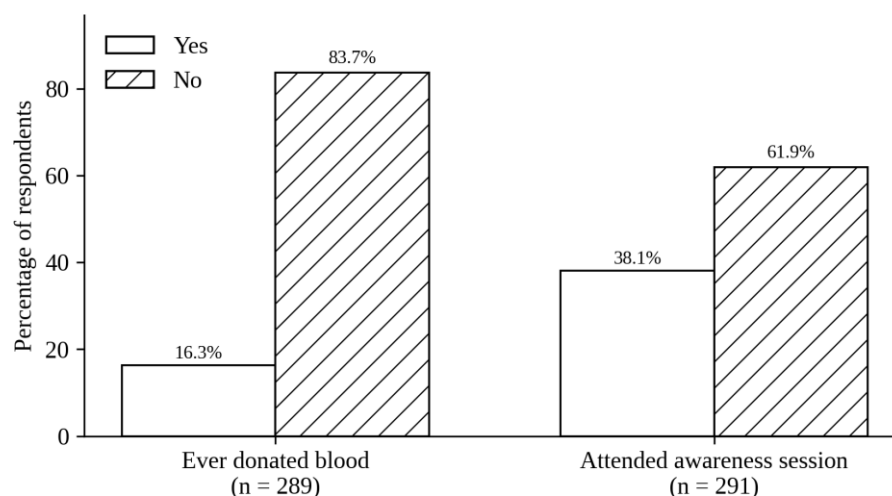
Figure 4.2*Blood Donation History and Attendance at an Awareness Session*

Figure 4.2 places two of the study's central facts side by side. More than eight in ten students (83.7%) had never donated blood, even though all were training for a health profession and most were old enough to be eligible. Attendance at awareness sessions was higher than donation

(38.1%), but the majority (61.9%) had not attended any session, which means that most students' ideas about donation came from sources other than organised teaching on the topic.

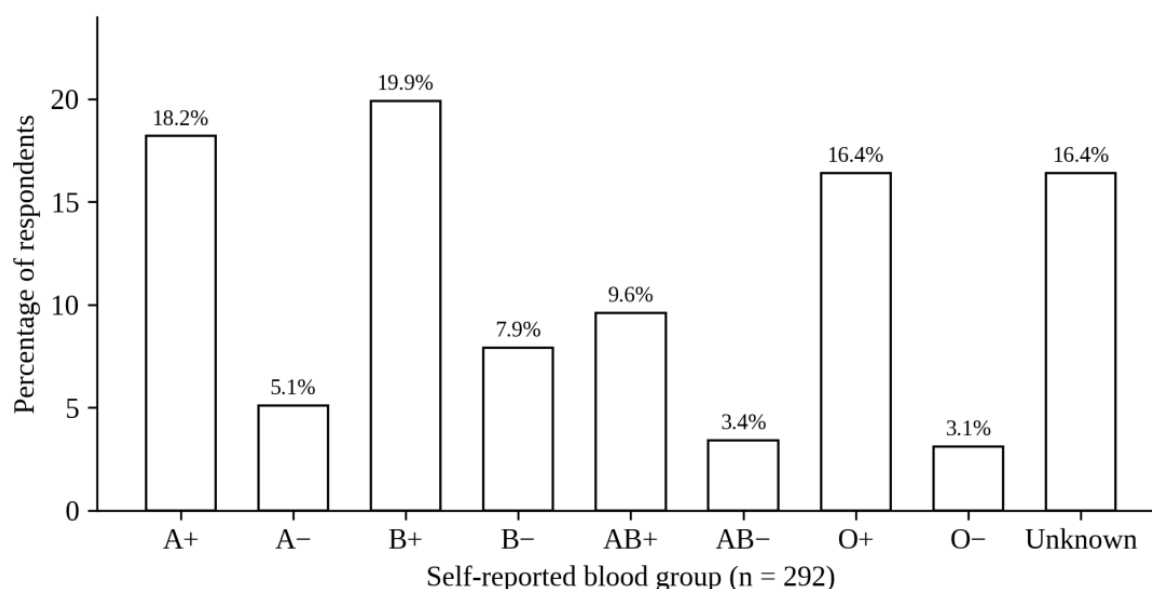
Figure 4.3*Self-Reported Blood Group of the Respondents*

Figure 4.3 shows the self-reported blood groups. B-positive (19.9%) and A-positive (18.2%) were the most frequent, followed by O-positive (16.4%). The figure also shows that 48 students (16.4%) did not know their own blood group, as many as reported the most common O group.

For nursing students this is a notable gap in personal health knowledge, and a student who does not know her blood group has probably not been screened as a donor. Blood groups were self-reported and were not verified.

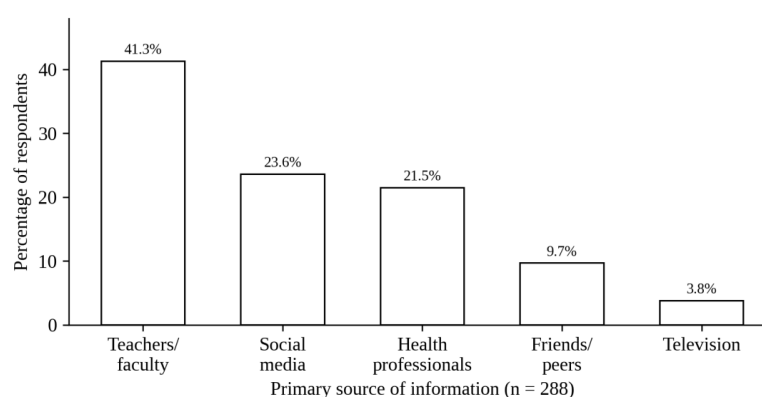
Figure 4.4*Primary Source of Information About Blood Donation*

Figure 4.4 shows that formal teaching dominated: 41.3% of students named teachers or faculty as their main source of information about blood donation. Social media came second (23.6%), ahead of health professionals (21.5%). Friends or peers (9.7%) and television

(3.8%) were minor sources. Almost one in four students therefore relied mainly on social media, a source whose accuracy the colleges cannot control. Section 4.9 examines whether scores differed by information source.

4.3 Myths and Misconceptions Regarding Blood Donation (Research Question 2)

Table 4.2*Responses to Statements on Myths and Misconceptions (Section B)*

Statement	SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	M (SD)	Agree %	Rank
M1. Blood banks profit commercially by selling blood collected from voluntary donors	26 (8.9)	37 (12.7)	49 (16.8)	131 (45.0)	48 (16.5)	3.47 (1.17)	61.5	1
M2. Donating blood puts the donor at risk of blood-borne infections (e.g., HIV, hepatitis B/C)	43 (14.7)	44 (15.1)	50 (17.1)	100 (34.2)	55 (18.8)	3.27 (1.33)	53.1	2
M3. Blood donation directly triggers vasovagal syncope (fainting) in most donors	19 (6.5)	59 (20.2)	79 (27.1)	99 (33.9)	36 (12.3)	3.25 (1.11)	46.2	3
M4. Regular blood donation leads to chronic anaemia in healthy individuals	81 (27.8)	99 (34.0)	50 (17.2)	48 (16.5)	13 (4.5)	2.36 (1.18)	21.0	4
M5. Females are physically unfit to donate blood under any circumstances	95 (32.5)	101 (34.6)	38 (13.0)	41 (14.0)	17 (5.8)	2.26 (1.22)	19.9	5
M6. Religious teachings explicitly forbid or discourage blood donation	134 (45.9)	88 (30.1)	29 (9.9)	26 (8.9)	15 (5.1)	1.97 (1.18)	14.0	7

Statement	SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	M (SD)	Agree %	Rank
M7. Blood donation causes long-term negative effects on general health and physical strength	121 (41.4)	106 (36.3)	29 (9.9)	27 (9.2)	9 (3.1)	1.96 (1.08)	12.3	8
M8. The process of donating blood is an extremely painful procedure	90 (30.8)	136 (46.6)	38 (13.0)	20 (6.8)	8 (2.7)	2.04 (0.98)	9.6	9
M9. Donating blood leads to permanent physical weakness or reduced immunity	33 (11.3)	168 (57.5)	47 (16.1)	36 (12.3)	8 (2.7)	2.38 (0.94)	15.1	6

Note. SD = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree. Agree % = agree plus strongly agree. Rank 1 = most endorsed. M1 and M4, n = 291; all other items, n = 292.

Table 4.2 answers the second research question. Three statements were accepted by roughly half the students or more. The most endorsed was that blood banks profit commercially by selling blood from voluntary donors (61.5% agreement; $M = 3.47$). The second was that donating blood puts the donor at risk of blood-borne infections such as HIV and hepatitis (53.1%; $M = 3.27$), and the third was that donation triggers fainting in most donors (46.2%; $M = 3.25$). A further 27.1% were neutral on the fainting item, so fewer than three in ten students rejected it. The remaining six statements were rejected by most students, although each still had a

meaningful minority in agreement. About one in five agreed that regular donation causes chronic anaemia (21.0%) and that women are unfit to donate under any circumstances (19.9%). Fewer agreed that donation causes permanent weakness or reduced immunity (15.1%), that religious teaching forbids donation (14.0%), that it causes long-term harm to health and strength (12.3%), or that it is extremely painful (9.6%). The weakness item (M9) stands out because 57.5% chose "disagree" rather than "strongly disagree" and 16.1% were neutral, which suggests uncertainty rather than firm rejection.

Figure 4.5

Percentage of Students Endorsing Each Myth or Misconception

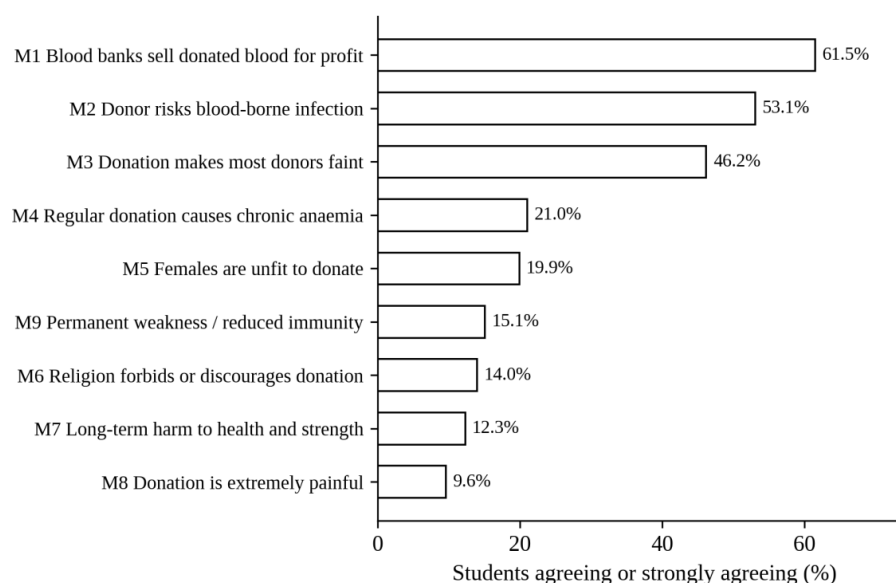


Figure 4.5 ranks the nine statements by endorsement and shows a clear break after the third item. The top three, concerning the commercial use of blood, infection risk to the donor, and fainting, were each endorsed by 46–62% of students, while none of the other six

exceeded 21%. The misconceptions most common in this group therefore concern the donation process and the institutions that handle blood, rather than beliefs about lasting damage to the body, religious prohibition, or pain, which most students rejected.

4.4 Fears and Anxiety Related to Blood Donation

Table 4.3

Responses to Statements on Fears and Anxiety (Section C)

Statement	SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	M (SD)	Agree %	Rank
F1. I feel anxious or afraid regarding the size of the needle	63 (21.6)	67 (23.0)	53 (18.2)	77 (26.5)	31 (10.7)	2.81 (1.33)	37.1	3
F2. I am concerned that donating blood will cause severe physical weakness afterwards	42 (14.4)	76 (26.1)	67 (23.0)	81 (27.8)	25 (8.6)	2.90 (1.21)	36.4	4
F3. I worry that mandatory screening might diagnose an unexpected medical condition	38 (13.0)	63 (21.6)	71 (24.3)	93 (31.8)	27 (9.2)	3.03 (1.20)	41.1	2
F4. I am apprehensive about dizziness or light-headedness after donation	36 (12.3)	56 (19.2)	58 (19.9)	108 (37.0)	34 (11.6)	3.16 (1.22)	48.6	1
F5. The sight of blood or needle insertion causes me significant fear or discomfort	67 (22.9)	62 (21.2)	62 (21.2)	73 (25.0)	28 (9.6)	2.77 (1.31)	34.6	5
F6. I am hesitant to donate due to fear of unexpected medical complications	13 (4.5)	53 (18.2)	146 (50.0)	63 (21.6)	17 (5.8)	3.06 (0.90)	27.4	6

Note. Abbreviations as in Table 4.2. F1 and F2, n = 291; all other items, n = 292.

Table 4.3 shows that fear was more evenly spread than belief in myths. The most common fear was of dizziness or light-headedness after donation (48.6% agreement; M = 3.16), followed by worry that pre-donation screening might uncover an unexpected medical condition (41.1%; M = 3.03). Between a third and two fifths of students

agreed with the needle-size item (37.1%), the concern about severe weakness afterwards (36.4%), and discomfort at the sight of blood or needle insertion (34.6%). The item on unexpected complications (F6) had the lowest agreement (27.4%) but drew a neutral response from half the sample (50.0%), the highest neutral share of any item in the questionnaire

Figure 4.6
Percentage of Students Reporting Each Fear

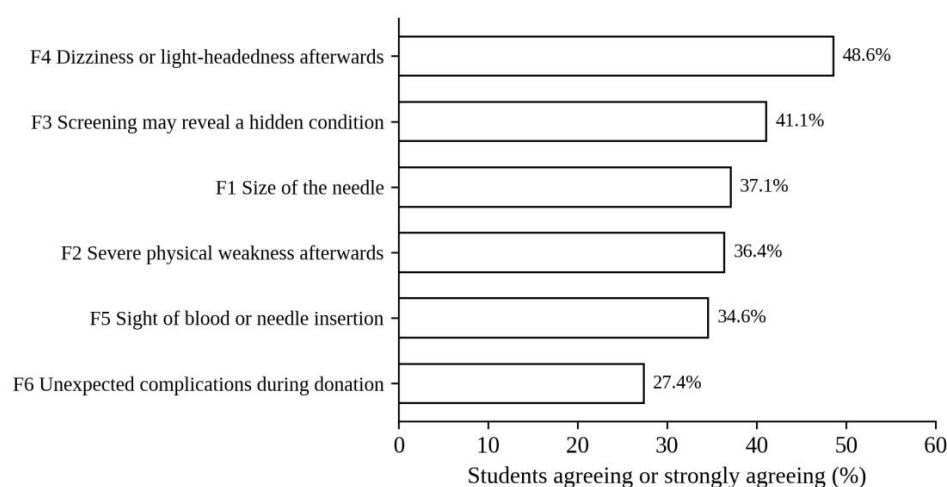


Figure 4.6 shows that no single fear dominated; endorsement ranged narrowly from 27.4% to 48.6%. The two leading fears, dizziness and a possible diagnosis at screening, concern what might happen to the donor physically or

medically, whereas the classic fears of the needle and of blood were each reported by about a third. The screening fear is worth noting because it is rarely discussed in awareness campaigns, yet four in ten students agreed with it.

4.5 Knowledge and Awareness Regarding Blood Donation (Research Question 1)

Table 4.4

Responses to Statements on Knowledge and Awareness (Section D)

<i>Statement</i>	<i>SD n (%)</i>	<i>D n (%)</i>	<i>N n (%)</i>	<i>A n (%)</i>	<i>SA n (%)</i>	<i>M (SD)</i>	<i>Agree %</i>	<i>Rank</i>
<i>K1. Blood donation is medically safe for healthy, non-anaemic individuals</i>	9 (3.1)	20 (6.8)	29 (9.9)	133 (45.5)	101 (34.6)	4.02 (1.00)	80.1	1
<i>K2. Familiar with the standard age, weight and haemoglobin eligibility criteria</i>	10 (3.4)	43 (14.7)	63 (21.6)	121 (41.4)	55 (18.8)	3.58 (1.06)	60.3	7
<i>K3. Donated blood undergoes routine screening for transmissible infections</i>	10 (3.4)	21 (7.2)	40 (13.7)	119 (40.8)	102 (34.9)	3.97 (1.04)	75.7	4
<i>K4. The body physiologically replenishes the blood volume lost during donation</i>	6 (2.1)	28 (9.6)	48 (16.4)	131 (44.9)	79 (27.1)	3.85 (0.99)	71.9	5
<i>K5. One unit of whole blood can be separated into components that help several patients</i>	7 (2.4)	18 (6.2)	35 (12.0)	111 (38.0)	121 (41.4)	4.10 (0.99)	79.5	2

<i>Statement</i>	<i>SD n (%)</i>	<i>D n (%)</i>	<i>N n (%)</i>	<i>A n (%)</i>	<i>SA n (%)</i>	<i>M (SD)</i>	<i>Agree %</i>	<i>Rank</i>
<i>K6. Know the recommended minimum interval between two donations</i>	6 (2.1)	33 (11.3)	53 (18.2)	126 (43.2)	74 (25.3)	3.78 (1.01)	68.5	6
<i>K7. Aware of dietary and hydration measures before and after donation</i>	1 (0.3)	22 (7.6)	43 (14.8)	198 (68.0)	27 (9.3)	3.78 (0.73)	77.3	3

Note. Abbreviations as in Table 4.2. K7, n = 291; all other items, n = 292. Rank 1 = highest agreement (most frequently claimed knowledge).

Table 4.4 addresses the first research question. Students rated their knowledge highly on most items. Four out of five agreed that donation is medically safe for healthy, non-anaemic people (80.1%; $M = 4.02$) and that one unit of whole blood can be separated into components for several patients (79.5%; $M = 4.10$). Three

quarters knew that donated blood is screened for transmissible infections (75.7%), and 71.9% knew that the body replaces the lost volume. Self-rated knowledge was weaker on the practical rules of donation: 68.5% claimed to know the minimum interval between donations, and only 60.3% were familiar with the age, weight, and haemoglobin criteria, the lowest-ranked item.

Figure 4.7

Percentage of Students Agreeing With Each Knowledge Statement

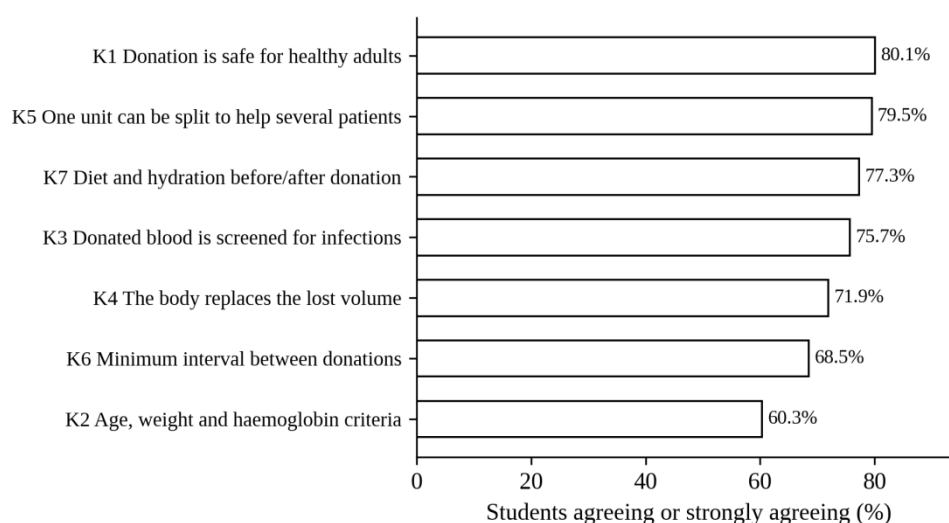


Figure 4.7 shows that general facts about the value and safety of donation were claimed by 72–80% of students, while the practical rules that determine whether a person can donate were claimed by fewer. Four in ten students did not claim familiarity with eligibility criteria, the very information a nurse needs to advise a

relative or patient whether they can donate. The figure should also be read against Table 4.2: 75.7% agreed that donated blood is screened for infection, yet 53.1% agreed that donors risk infection, which means that many students held both views at once.

4.6 Overall Scores and Levels

Table 4.5

Descriptive Statistics and Levels of the Composite Scores (N = 292)

Statistic	Myths and misconceptions	Fear and anxiety	Knowledge / awareness
Mean score (1-5), M (SD)	2.55 (0.65)	2.96 (0.79)	3.87 (0.57)
95% CI of mean	2.48 – 2.63	2.87 – 3.05	3.80 – 3.93
Median	2.44	3.00	4.00
Minimum – maximum	1.11 – 4.33	1.00 – 4.83	1.71 – 5.00
Total score, M (SD)	22.97 (5.85)	17.74 (4.72)	27.08 (4.00)
Possible total range	9 – 45	6 – 30	7 – 35
Percentage of maximum	38.8%	48.9%	71.7%
Low (1.00–2.33), n (%)	93 (31.8)	56 (19.2)	6 (2.1)
Moderate (2.34–3.66), n (%)	176 (60.3)	170 (58.2)	74 (25.3)
High (3.67–5.00), n (%)	23 (7.9)	66 (22.6)	212 (72.6)

Table 4.5 summarises the three scales. The mean myths score of 2.55 lies just inside the moderate band, and the percentage-of-maximum score of 38.8% shows that, on average, students leaned towards disagreeing with the myths without rejecting them firmly. Six in ten (60.3%) fell in the moderate band and 7.9% in the high band, so about two thirds of students held at least a

moderate level of misconception. The fear score (M = 2.96) sat near the neutral midpoint, with 22.6% in the high band. Knowledge was high: the mean was 3.87, the median 4.00, and 72.6% of students scored in the high band, while only six students (2.1%) scored low.

Figure 4.8

Levels of Myths, Fear, and Knowledge Among the Respondents

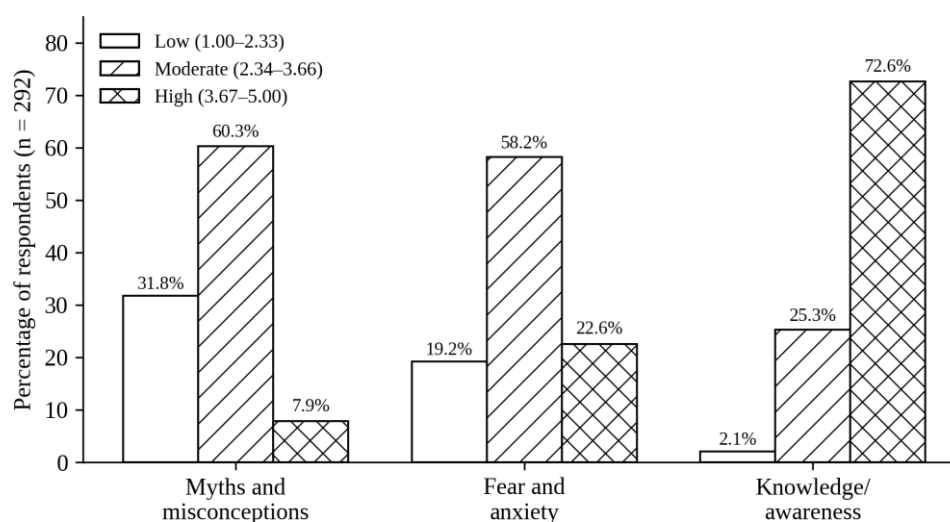


Figure 4.8 shows the three distributions together. Myths and fear were both concentrated in the moderate band, but they differed at the extremes: nearly a third of students were low on myths, whereas more than a fifth were high on fear. Knowledge followed the opposite pattern,

with most students in the high band. The combination of high self-rated knowledge with moderate misconceptions and fear is the main descriptive finding of the study and is examined further in Sections 4.7 and 4.8.

Table 4.6*Normality Tests for the Composite Scores*

Score	Skewness	Kurtosis	K-S statistic	K-S p	S-W statistic	S-W p
Myths and misconceptions	0.55	0.40	.096	< .001	.970	< .001
Fear and anxiety	−0.18	−0.32	.077	< .001	.990	.034
Knowledge / awareness	−0.77	1.00	.136	< .001	.958	< .001

Note. K-S = Kolmogorov-Smirnov with Lilliefors correction; S-W = Shapiro-Wilk; df = 292. Standard errors: skewness 0.143, kurtosis 0.284.

Table 4.6 shows that the formal tests rejected normality for all three scores, which is common in samples of this size, where small departures reach significance. The myths score was mildly skewed to the right and the knowledge score to the left, with a slightly peaked distribution, but

all skewness and kurtosis values were well within ± 2 . Parametric tests were therefore used as the primary analyses, and every comparison was repeated with a non-parametric test. The two sets of results agreed in direction and significance throughout, except where noted.

4.7 Blood Donation Status and Myths, Fear, and Knowledge (Research Question 3)

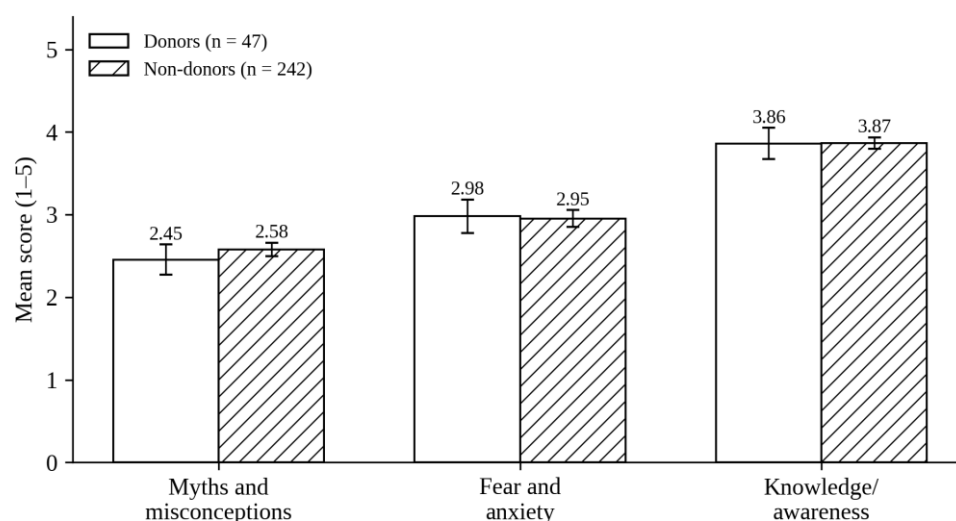
Table 4.7*Comparison of Scores Between Students Who Had and Had Not Donated Blood*

Score	Donors (n = 47) M (SD)	Non-donors (n = 242) M (SD)	t (287)	p	Cohen's d	Mann-Whitney U	p
Myths and misconceptions	2.45 (0.64)	2.58 (0.65)	−1.22	.224	−0.19	4932.0	.149
Fear and anxiety	2.98 (0.70)	2.95 (0.81)	0.21	.831	0.03	5646.5	.938
Knowledge / awareness	3.86 (0.66)	3.87 (0.56)	−0.06	.952	−0.01	5546.0	.787

Note. Levene's test was non-significant for all three scores ($p \geq .115$), so equal-variance t tests are reported. Three students did not report donation status.

Table 4.7 gives the first answer to the third research question. Donors scored slightly lower on myths than non-donors (2.45 vs. 2.58), but the difference was small ($d = -0.19$) and not statistically significant, $t(287) = -1.22$, $p = .224$, with the Mann-Whitney test agreeing ($U = 4932.0$, $p = .149$). Donors and non-donors were

almost identical on fear ($p = .831$) and knowledge ($p = .952$). With only 47 donors, the study could reliably detect a difference of about half a standard deviation; a smaller true difference in myths cannot be ruled out.

Figure 4.9*Mean Scores of Donors and Non-Donors*

Note. Error bars show 95% confidence intervals.

Figure 4.9 makes the result visible. The bars for donors and non-donors are nearly level on all three scales, and their confidence intervals overlap widely. The only visible gap is the slightly lower myth score among donors, which is in the

expected direction but falls well within the range of chance. Having donated blood was not associated with holding fewer myths, less fear, or more knowledge in this sample.

Table 4.8*Levels of Myths, Fear, and Knowledge by Blood Donation Status*

Score level	Donors n (%)	Non-donors n (%)	χ^2 (df = 2)	p	Cramér's V
Myths: Low	21 (44.7)	70 (28.9)	4.53	.104	.125
Myths: Moderate	23 (48.9)	152 (62.8)			
Myths: High	3 (6.4)	20 (8.3)			
Fear: Low	7 (14.9)	48 (19.8)	0.64	.728	.047
Fear: Moderate	29 (61.7)	139 (57.4)			
Fear: High	11 (23.4)	55 (22.7)			
Knowledge: Low	2 (4.3)	4 (1.7)	1.52	.469	.072
Knowledge: Moderate	13 (27.7)	61 (25.2)			
Knowledge: High	32 (68.1)	177 (73.1)			

Note. Percentages are within donation-status groups. For myths and knowledge, one cell (16.7%) had an expected count below 5.

Table 4.8 compares the distribution of score levels. The clearest difference was in the low-myths band, which included 44.7% of donors against 28.9% of non-donors, but the overall association did not reach significance, $\chi^2(2) = 4.53$, $p = .104$, $V = .125$. The linear-by-linear test,

which uses the ordering of the levels, came close ($p = .058$). Fear levels were distributed almost identically ($p = .728$), and knowledge levels did not differ ($p = .469$). Because the high-myth and low-knowledge cells were small, these tests should be read as indicative.

Table 4.9*Binary Logistic Regression of Myths, Fear, and Knowledge on Having Donated Blood (n = 289)*

Predictor	B	SE	Wald	p	OR	95% CI for OR
Myths and misconceptions	-0.379	0.273	1.94	.164	0.68	0.40 - 1.17
Fear and anxiety	0.156	0.220	0.50	.478	1.17	0.76 - 1.80
Knowledge / awareness	-0.055	0.281	0.04	.846	0.95	0.55 - 1.64
Constant	-0.937	1.298	0.52	.470	0.39	

Note. Outcome coded 1 = has donated, 0 = has not donated. Model $\chi^2(3) = 2.04$, $p = .564$; Nagelkerke $R^2 = .012$; Hosmer-Lemeshow $\chi^2(8) = 6.95$, $p = .542$. The model classified all cases as non-donors (overall accuracy 83.7%).

Table 4.9 tests the three scores together. The model as a whole did not predict donation, $\chi^2(3) = 2.04$, $p = .564$, and explained about 1% of the variation in donor status (Nagelkerke $R^2 = .012$). Each one-point increase in the myths score was associated with 32% lower odds of having donated (OR = 0.68), but the confidence interval ran from 0.40 to 1.17, so the data are

also consistent with no effect. Fear and knowledge had odds ratios close to 1. The answer to the third research question is therefore that no statistically significant relationship between blood donation and myths and misconceptions was found in this sample, although the direction of the estimates matched expectations.

4.8 Relationship Between Myths and Knowledge

Table 4.10*Correlations Among Myths, Fear, and Knowledge Scores (N = 292)*

Pair of scores	Pearson r	p	Spearman ρ	p
Myths - Fear	.367	< .001	.313	< .001
Myths - Knowledge	-.012	.845	-.057	.331
Fear - Knowledge	.148	.012	.112	.056

Table 4.10 shows that myths and fear were moderately and positively correlated ($r = .37$, $p < .001$): students who accepted more myths also reported more fear. Myths and knowledge, the independent and dependent variables named in the proposal, were not correlated at all ($r = -.01$, $p = .845$). Fear showed a weak positive

correlation with knowledge ($r = .15$, $p = .012$), meaning that students who rated their knowledge higher reported slightly more fear, not less. This correlation fell just short of significance with Spearman's rank method ($\rho = .11$, $p = .056$), so it should be treated as a weak association.

Table 4.11*Hierarchical Linear Regression Predicting Knowledge Score From Myths and Fear (N = 292)*

Model / predictor	B	SE	β	t	p	95% CI for B
Step 1						
Constant	3.894	0.136		28.66	< .001	3.63 - 4.16
Myths and misconceptions	-0.010	0.052	-.012	-0.20	.845	-0.11 - 0.09
Step 2						
Constant	3.661	0.158		23.21	< .001	3.35 - 3.97
Myths and misconceptions	-0.067	0.055	-.076	-1.22	.225	-0.18 - 0.04
Fear and anxiety	0.128	0.045	.175	2.81	.005	0.04 - 0.22

Note. Step 1: $R^2 = .000$, $F(1, 290) = 0.04$, $p = .845$. Step 2: $R^2 = .027$, adjusted $R^2 = .020$, $\Delta R^2 = .027$, $\Delta F(1, 289) = 7.91$, $p = .005$; overall $F(2, 289) = 3.98$, $p = .020$. VIF = 1.16 for both predictors; Durbin-Watson = 1.79.

Table 4.11 tests the proposed effect of myths on knowledge. At Step 1, myths explained none of the variance in knowledge ($R^2 = .000$, $p = .845$). Adding fear at Step 2 raised the explained variance to 2.7%, a significant but small change ($\Delta R^2 = .027$, $p = .005$). Fear was the only significant predictor ($\beta = .175$, $p = .005$): each one-point rise in fear corresponded to a 0.13-point rise in self-rated knowledge, holding myths

constant. Multicollinearity was not a concern (VIF = 1.16), and the residual plots showed no serious departures from the model's assumptions. The hypothesised relationship, in which more myths go with less knowledge, was not supported. In these students, misconceptions and self-rated knowledge appear to be largely independent of each other.

4.9 Scores Across Demographic Groups

Table 4.12

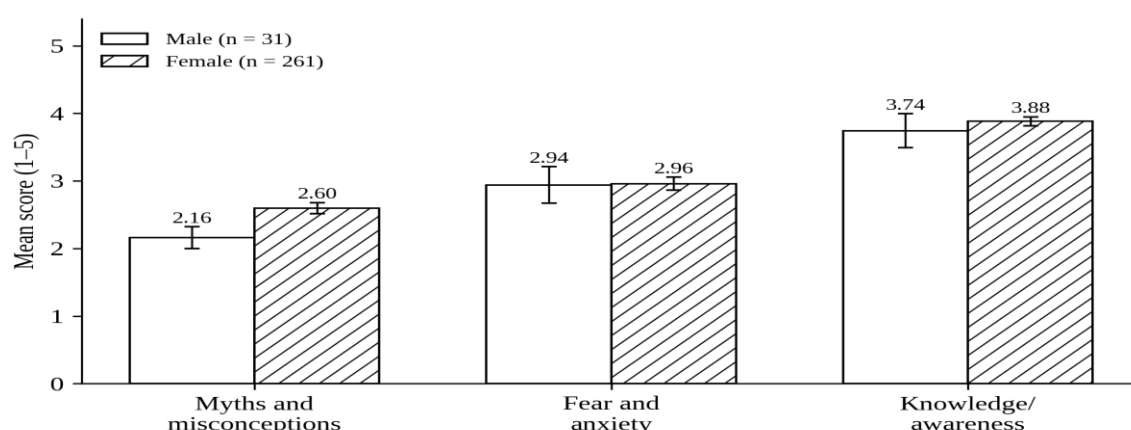
Comparison of Scores by Gender, Residence, and Attendance at an Awareness Session

Variable / score	Group 1 M (SD)	Group 2 M (SD)	t	p	U	p
Gender	Male (n = 31)	Female (n = 261)				
Myths	2.16 (0.46)	2.60 (0.65)	-3.61	< .001	2466.0	< .001
Fear	2.94 (0.77)	2.96 (0.79)	-0.12	.905	3886.0	.719
Knowledge	3.74 (0.72)	3.88 (0.55)	-1.06 ^a	.296	3796.5	.574
Residence	Urban (n = 158)	Rural (n = 133)				
Myths	2.55 (0.62)	2.55 (0.69)	-0.02	.987	10450.5	.937
Fear	2.98 (0.77)	2.94 (0.81)	0.43	.666	9984.5	.464
Knowledge	3.87 (0.56)	3.87 (0.58)	0.03	.974	10429.0	.913
Awareness session	Yes (n = 111)	No (n = 180)				
Myths	2.57 (0.67)	2.54 (0.64)	0.30	.767	9488.0	.471
Fear	2.95 (0.75)	2.96 (0.81)	-0.16	.870	9689.5	.666
Knowledge	3.83 (0.62)	3.89 (0.54)	-0.98	.327	9739.5	.718

Note. Degrees of freedom: gender 290, residence and awareness 289. ^aWelch's t (df = 34.36) reported because Levene's test was significant ($p = .010$).

Table 4.12 shows one clear group difference. Female students scored higher on myths than male students (2.60 vs. 2.16), $t(290) = -3.61$, $p < .001$, a medium-sized difference ($d = 0.69$) that the Mann-Whitney test confirmed ($U = 2466.0$, $p < .001$). Men and women did not differ on fear

or knowledge. Urban and rural students had virtually identical scores on all three scales. Students who had attended an awareness session did not differ from those who had not on myths ($p = .767$), fear ($p = .870$), or knowledge ($p = .327$).

Figure 4.10*Mean Scores of Male and Female Students*

Note. Error bars show 95% confidence intervals.

Figure 4.10 shows that the gender gap was confined to myths. The confidence intervals for male and female students do not overlap on the myths scale, whereas they overlap almost completely on fear and knowledge. Because the male group was small ($n = 31$), its interval is wide, and the size of the gap should be treated with some caution, but its direction is clear.

Table 4.13*Comparison of Scores by Year of Study*

Score	1st year ($n = 41$)	2nd year ($n = 72$)	3rd year ($n = 127$)	4th year ($n = 51$)	F / Welch F	p	Kruskal- Wallis H (p)
Myths	2.47 (0.55)	2.47 (0.65)	2.64 (0.69)	2.53 (0.61)	1.34	.262	1.41 (.704)
Fear	2.94 (0.60)	3.14 (0.67)	2.93 (0.89)	2.80 (0.78)	2.39 ^a	.072	6.22 (.101)
Knowledge	3.84 (0.52)	3.99 (0.49)	3.79 (0.60)	3.90 (0.63)	1.90	.130	6.02 (.111)

Note. Values are M (SD). One-way ANOVA $df = 3, 287$. ^aWelch's F ($df = 3, 125.70$) reported because Levene's test was significant ($p = .001$).

Table 4.13 shows that year of study made no significant difference to any score. Third-year students had the highest myths score (2.64) and second-year students the highest fear and knowledge scores, but none of these differences reached significance with either parametric or

non-parametric tests. Students in their final year held about as many misconceptions as those in their first, which suggests that the nursing curriculum as currently taught does not by itself reduce these beliefs.

Table 4.14*Comparison of Scores Across the Four Nursing Colleges*

Score	GCN (LRH)	PGCN	GCN (KTH)	GCN (HMC)	Welch F / F	p	η^2	Kruskal- Wallis H (p)
Myths	2.55 (0.47)	2.33 (0.57)	2.38 (0.65)	2.94 (0.72)	12.21 ^a	< .001	.136	34.14 (< .001)
Fear	2.76 (0.83)	2.95 (0.87)	2.87 (0.65)	3.25 (0.71)	5.84 ^b	.001	.053	16.40 (.001)
Knowledge	3.81 (0.54)	3.88 (0.62)	3.96 (0.53)	3.82 (0.60)	1.03	.378	.011	4.65 (.199)

Note. Values are M (SD); $n = 73$ per college. ^aWelch's F ($df = 3, 158.15$); ^bWelch's F ($df = 3, 159.02$), used because Levene's test was significant. Knowledge: one-way ANOVA $F(3, 288)$. Games-Howell post hoc

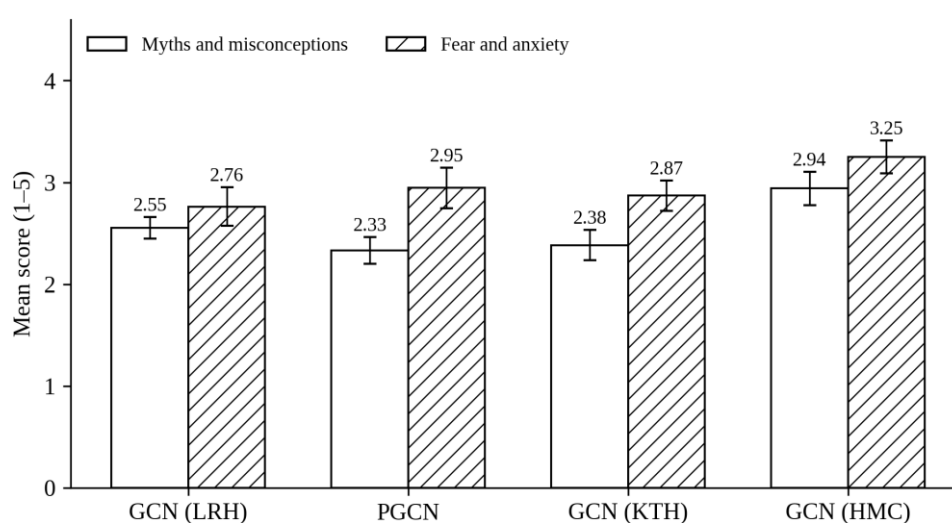
tests: myths, HMC higher than LRH ($p = .001$), PGCN ($p < .001$), and KTH ($p < .001$); fear, HMC higher than LRH ($p = .001$) and KTH ($p = .005$).

Table 4.14 shows marked differences between colleges on myths and fear. Students at the Government College of Nursing, HMC, had the highest myths score (2.94), significantly above each of the other three colleges, Welch's $F(3, 158.15) = 12.21$, $p < .001$. College membership accounted for 13.6% of the variance in myths, a medium-to-large effect. HMC students also

reported the most fear (3.25), significantly more than students at LRH and KTH, $p = .001$. The PGCN and KTH students held the fewest myths. Knowledge did not differ between colleges ($p = .378$). The Kruskal-Wallis tests confirmed all three results.

Figure 4.11

Mean Myths and Fear Scores by Nursing College



Note. GCN = Government College of Nursing. Error bars show 95% confidence intervals.

Figure 4.11 shows that the HMC college stands apart from the other three on both myths and fear, while the other colleges cluster together. At HMC the myths mean approached the neutral midpoint of 3, which means that the average student there was undecided about the

misconceptions rather than rejecting them. Because students were recruited by convenience within each college, part of this difference may reflect which students were reached, and the result should be confirmed before it is used to single out one institution.

Table 4.15

Comparison of Scores by Primary Source of Information

Score	Social media (n = 68)	Teachers/ faculty (n = 119)	Friends/ peers (n = 28)	Television (n = 11)	Health professionals (n = 62)	F/ Welch F	p	Kruskal- Wallis H (p)
Myths	2.67 (0.68)	2.54 (0.65)	2.48 (0.70)	3.07 (0.63)	2.36 (0.55)	3.85	.005	16.21 (.003)
Fear	2.98 (0.83)	3.06 (0.74)	3.05 (1.04)	3.18 (0.52)	2.64 (0.67)	4.46 ^a	.003	15.99 (.003)
Knowledge	3.88 (0.56)	3.82 (0.56)	3.88 (0.53)	3.99 (0.69)	3.92 (0.62)	0.43	.786	1.91 (.752)

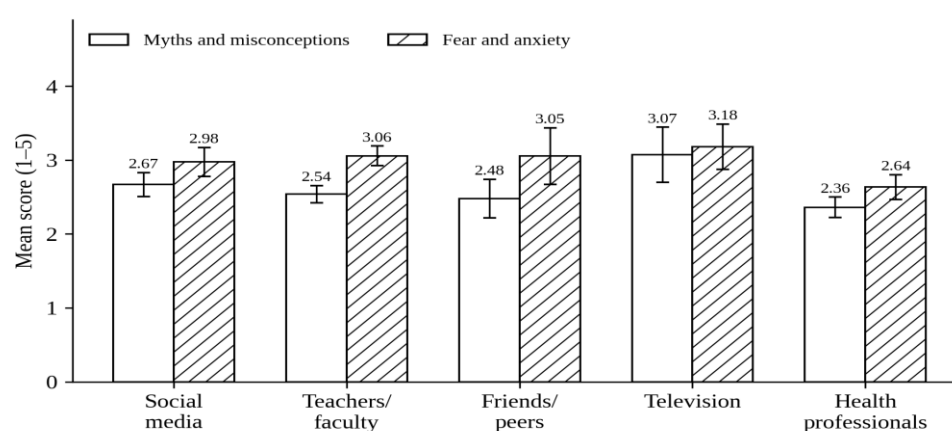
Note. Values are M (SD). One-way ANOVA $df = 4, 283$. ^aWelch's $F(df = 4, 57.21)$ because Levene's test was significant ($p = .002$). Post hoc: myths, television higher than health professionals (Tukey, $p < .05$) and social media higher than health professionals (Games-Howell, $p < .05$); fear, health professionals lower than teachers/faculty (Tukey and Games-Howell, $p < .05$) and television (Games-Howell, $p < .05$).

Table 4.15 shows that myths and fear varied with the students' main source of information, $F(4, 283) = 3.85$, $p = .005$ for myths and Welch's $F(4, 57.21) = 4.46$, $p = .003$ for fear, with each effect explaining about 5% of the variance. Students who relied on health professionals had the

lowest scores on both scales (myths 2.36; fear 2.64), and those who relied on television had the highest (3.07 and 3.18). Social media users held more myths than those informed by health professionals. Knowledge did not differ by source ($p = .786$).

Figure 4.12

Mean Myths and Fear Scores by Primary Source of Information



Note. Error bars show 95% confidence intervals.

Figure 4.12 shows the gradient across sources. The health-professional group is lowest on both scales and has narrow confidence intervals, while the television group is highest but, with only 11 students, has the widest intervals. Students informed mainly by teachers or faculty,

the largest group, did not differ from those informed by friends or social media. In this sample, information from health professionals was associated with fewer misconceptions and less fear, whereas classroom teaching was not.

4.10 Summary of Findings

Table 4.16

Summary of Findings by Research Question

Research question	Main finding
RQ1. Level of awareness and knowledge	High self-rated knowledge ($M = 3.87$; 72.6% high). Weakest items: eligibility criteria (60.3%) and donation interval (68.5%).
RQ2. Most common myths and misconceptions	Blood banks profit by selling blood (61.5%), donor risk of infection (53.1%), most donors faint (46.2%). Overall myths moderate ($M = 2.55$); 68.2% moderate or high.
RQ3. Relationship between blood donation and myths	No significant difference between donors (16.3%) and non-donors on myths ($p = .224$), fear, or knowledge; scores did not predict donation ($p = .564$).
Myths (IV) and knowledge (DV)	No relationship ($r = -.01$). Myths correlated with fear ($r = .37$); fear weakly and positively predicted knowledge ($\beta = .18$).

Research question	Main finding
Group differences	Higher myths among females ($d = 0.69$), at the HMC college, and among students informed by television or social media; lowest among those informed by health professionals.

5. DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This study examined myths, fears, and self-rated knowledge about blood donation among 292 nursing students in four public-sector nursing colleges in Peshawar. This chapter interprets the main findings against the literature, draws conclusions for each research question, and sets out recommendations and limitations.

5.2 Discussion

5.2.1 Low Donation Experience in a Health-Profession Sample

Only 16.3% of the students had ever donated blood. This figure is close to that of medical students in Gaza, of whom 83.3% had never donated (Alsarafandi et al., 2023), and to the 19.3% donation rate among Ethiopian undergraduates (Mussema et al., 2024). It is lower than the 22.7% reported across 16 countries (Eltewacy et al., 2024) and well below the 35% of future healthcare workers in Rawalpindi who had donated (145 of 411; Arshad et al., 2024). The most likely explanation is the composition of the sample. Almost nine in ten respondents were women, and female students have consistently lower donation rates in student surveys (Bhuiya et al., 2022; Elteuacy et al., 2024; Kuriri, 2024). The low figure therefore reflects who nursing students in Peshawar are as much as what they believe, and it means that any recruitment effort in these colleges has to address the specific concerns and eligibility questions of young women.

5.2.2 The Most Common Misconceptions

The three most widely endorsed statements (that blood banks profit from donated blood, that donors risk infection, and that most donors faint) concern the donation process and the institutions behind it. Beliefs about lasting bodily harm, religious prohibition, and pain were rejected by most students. This ordering differs from the non-donors in Rawalpindi, whose most common fear was damage to their

general health (Arshad et al., 2024), and from Bangladeshi respondents, 21% of whom thought donation harmful to health (Hossain et al., 2022). Nursing education appears to have done its most effective work on the physiological myths, where students can draw on what they have learned about blood volume and haematopoiesis, and less on questions what happens to blood and to donors inside a blood bank.

The infection item deserves particular attention. More than half the students agreed that donors risk HIV or hepatitis, yet three quarters also agreed that donated blood is screened for infections. The two beliefs can be held together only if students do not separate the safety of the donor, who is protected by sterile single-use equipment, from the safety of the recipient, who depends on screening. The same confusion is plausible in a country where transfusion-transmissible infections among donors remain a documented problem (Ehsan et al., 2020) and where fear of infection has been named as a leading barrier among Peshawar undergraduates (Zahir et al., 2024). The finding suggests that teaching which explains donor protection separately from recipient screening may correct a belief that general statements about "safe blood" leave untouched.

The belief that blood banks profit from donated blood needs careful interpretation. The item had the weakest link with the rest of the myths scale (corrected item-total $r = .14$), which indicates that students answered it on a different basis from the physical myths. In Pakistan, patients and families commonly deal with blood banks at the point of need, and students may have agreed on the basis of what they had observed about processing charges or private banks rather than a false belief about donation itself. The item probably measures distrust of the system more than a physiological misconception, which places it closer to the medical mistrust reported by 14% of the multinational student sample (Eltewacy et al., 2024) and among Saudi respondents (Alanazi et

al., 2023). Distrust of this kind is unlikely to be corrected by teaching alone; it calls for visible transparency from blood services about how voluntary donations are used.

Almost half the students believed that most donors faint. Haemovigilance data show that fainting and other vasovagal reactions occur in a small fraction of donations (Li et al., 2024; Piccinini et al., 2022), although self-reported milder reactions are more common (Orru' et al., 2021). The myth is a distortion of a real but uncommon event, and it may itself raise the risk it describes, since fear before donation is associated with a higher chance of a reaction (Thijssen et al., 2023; Wu et al., 2025). The fear scale pointed in the same direction: dizziness after donation was the single most common fear, endorsed by 48.6%. Young female first-time donors are the group at highest risk of vasovagal reactions (Wu et al., 2025), which is exactly the profile of most students in this sample, so their concern is not baseless. The appropriate response is to give accurate figures and practical preparation, such as hydration and counter-pressure manoeuvres (Williams et al., 2022), rather than to dismiss the fear.

One in five students agreed that women are unfit to donate under any circumstances. Female students also held more myths overall than male students, with a medium-sized difference ($d = 0.69$). The direction is the reverse of the knowledge advantage that female students often show on factual tests (Halawani, 2024; Javaeed et al., 2020). One possible explanation is that women in this setting are more exposed to beliefs about their own supposed frailty as donors, and may have had fewer opportunities to test those beliefs by donating; the questionnaire did not ask about deferral or opportunity, however, and the male group was small. The finding nonetheless indicates that awareness activities in nursing colleges, where most students are women, need to address women's eligibility directly.

5.2.3 Knowledge: High Self-Ratings With Practical Gaps

Self-rated knowledge was high, with 72.6% of students in the high band, which resembles the 69–73% adequate-knowledge figures reported among health-science students in Ethiopia and Uganda (Nannono et al., 2025; Yosef et al.,

2021). The gaps lay in the same areas identified elsewhere. Only 60.3% claimed familiarity with age, weight, and haemoglobin criteria, and 68.5% with the interval between donations, echoing the finding that 68.1% of Gaza medical students did not know the interval and fewer than a third knew the age and weight criteria (Alsarafandi et al., 2023), and the eligibility gaps among young Saudi adults (Kuriri, 2024). These are the details that decide whether a person can donate, and they are also what a nurse is most likely to be asked.

The knowledge scale relied on self-assessment ("I know", "I am aware") rather than questions with a correct answer, and this matters for interpretation. Studies that tested knowledge objectively among nursing and health-science students found much lower scores (Martinez-Santos et al., 2021, 2022). The high knowledge scores in this study should therefore be read as students' confidence in their knowledge rather than as proof of accurate knowledge, and some of that confidence may be misplaced, as the coexistence of the infection myth with claimed knowledge of screening suggests.

5.2.4 Myths, Knowledge, and Fear

The proposal expected myths to be associated with lower knowledge. They were not; the correlation was effectively zero. This contrasts with studies in which knowledge and attitude move together, such as the positive knowledge-attitude correlation in southwest Ethiopia ($r = 0.30$; Yosef et al., 2021) and the knowledge-to-attitude pathway in Wuhan (Ma et al., 2024). Two features of this study probably explain the difference. First, knowledge was self-rated, and a student can feel well informed while still holding a specific false belief. Second, the most endorsed myths concern institutions and the donation procedure, which the knowledge items did not directly address. Knowledge and misconceptions appear to occupy separate compartments for these students, so raising general knowledge may not remove misconceptions unless teaching confronts them directly.

Fear was moderately associated with myths ($r = .37$), consistent with the view that fear and misconception reinforce each other (Arshad et al., 2024; Thusoo & Mishra, 2025). The weak positive association between fear and knowledge was unexpected. One possible explanation is

that clinical training exposes students to the adverse effects of donation and transfusion, such as fainting donors or reactions on the ward, so that greater familiarity brings more awareness of what can go wrong. The effect was small (2.7% of variance) and lost significance under a rank-based test, so it should not be over-interpreted.

5.2.5 Beliefs and Donation Status

Donors and non-donors did not differ significantly on myths, fear, or knowledge, and the three scores together did not predict donation. This finding departs from studies in which knowledge was associated with donation (Dejene et al., 2021; Shama et al., 2022) and in which regular donors had higher knowledge (Kocic et al., 2024). The estimates did point in the expected direction: donors held slightly fewer myths, were more often in the low-myths band (44.7% vs. 28.9%), and each point on the myths scale was associated with lower odds of having donated. With only 47 donors, the study had limited power to detect differences smaller than about half a standard deviation, so the null result is best read as showing that any link between these beliefs and donation in this group is modest. It is also likely that for young women in nursing colleges the decisive barriers are practical ones, such as eligibility, deferral, and never having been asked (Reid et al., 2025), rather than beliefs.

5.2.6 Awareness Sessions, Information Sources, and Colleges

Students who had attended an awareness session scored no differently from those who had not. Educational interventions have produced large gains among health-science students in Pakistan and India (Mohan et al., 2024; Saqlain et al., 2024), and an education programme cut high myth scores among Egyptian nursing students from 90% to 4% (Khaled et al., 2023). The absence of any difference here suggests that the sessions students had attended, whose content and timing were not recorded, did not address the misconceptions measured in this study.

The information-source results offer a practical lead. Students who relied mainly on health professionals had the lowest myths and fear scores, while those who relied on television or social media had the highest. Social media can also help: students in Bangladesh who had seen

online donation campaigns were more likely to donate (Bhuiyea et al., 2022). The present data suggest that contact with practising health professionals, such as blood-bank staff, may be more effective than classroom teaching, since students informed mainly by teachers were no different from those informed by peers. Because the design was cross-sectional, it is also possible that students with fewer misconceptions seek out professional sources.

The higher myth and fear scores at the HMC college were the largest group difference in the study, with college accounting for 13.6% of the variance in myths. The questionnaire cannot explain this difference. It may reflect differences in teaching, in the year-of-study mix of the students reached, or in the conditions of data collection, and it should be investigated before conclusions are drawn about any institution.

5.3 Conclusion

In answer to the first research question, nursing students in the public-sector colleges of Peshawar rated their knowledge of blood donation highly, but a substantial minority did not claim familiarity with the eligibility criteria and the interval between donations. In answer to the second, the most common misconceptions were that blood banks profit by selling donated blood, that donors risk blood-borne infection, and that donation makes most donors faint; overall, about two thirds of students held a moderate or high level of misconception. In answer to the third, no significant relationship was found between these beliefs and having donated blood, although the estimates pointed in the expected direction. Myths were unrelated to self-rated knowledge but were associated with fear. Female students, students at one college, and students who relied on television or social media held more misconceptions, while those informed by health professionals held the fewest. Only one in six students had donated, and attending an awareness session made no measurable difference to their beliefs.

5.4 Recommendations

5.4.1 For Nursing Colleges

Teach donor safety and recipient safety as separate topics, explaining sterile single-use collection equipment alongside the screening of

donated blood, to correct the belief that donors risk infection.

Include the exact eligibility criteria, deferral rules, and donation interval, with specific attention to women's eligibility and haemoglobin requirements, in the early years of the curriculum.

Present accurate figures on vasovagal reactions and teach practical preparation (hydration, eating before donation, and counter-pressure manoeuvres) so that fear of fainting is addressed rather than dismissed.

Invite blood-bank staff and other practising health professionals to lead awareness sessions, since students informed by health professionals held the fewest myths.

Review the content of existing awareness sessions against the misconceptions identified in this study, since attendance was not associated with any difference in scores.

5.4.2 For Blood Banks and Transfusion Services

Explain openly how voluntary donations are used and what any processing charges cover, to address the widespread belief that blood banks profit from donated blood.

Organise supervised donation drives within nursing colleges, with haemoglobin screening, so that students who are eligible have a convenient opportunity to donate and those who are deferred understand why.

5.4.3 For Future Research

Measure knowledge with objective true-or-false or multiple-choice items alongside self-ratings, to separate confidence from accuracy.

Use probability sampling across public and private nursing colleges and include enough male students and donors to compare groups with adequate power.

Evaluate a targeted educational intervention with a pre-test and post-test design, measuring changes in specific misconceptions and in actual donation.

Revise or split the blood-bank profit item, which behaved differently from the other myths, and examine the reasons for the higher scores at the HMC college.

5.5 Limitations

Several limitations affect how far these results can be taken. Convenience sampling with equal quotas per college means that the sample may not represent all nursing students in Peshawar; students who were absent, or who chose not to take part, may differ in their beliefs, and the college comparison is particularly sensitive to who was reached. The cross-sectional design shows associations but not their direction, so it cannot establish, for example, whether information from health professionals reduces myths or whether students with fewer myths prefer such sources. Knowledge was self-rated and is likely to overstate actual knowledge. The knowledge scale's reliability ($\alpha = .675$) was slightly below the conventional threshold, and one myth item (M1) fitted poorly with the others. Only 47 students had donated, which limited the power of the donor comparisons, and donation history was self-reported without detail on frequency or deferral. Age was recorded in bands, which prevented a finer analysis by age. Finally, a small number of out-of-range entries were set to missing during cleaning; they affected no more than one item per respondent per scale and are unlikely to have changed the results.

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