BG Pulse Journal USA
ISSN:1947-2536 http://www.bgpulseusa.com/index.php/bg
BG PULSE JOURNAL

ASSESSMENT OF KNOWLEDGE REGARDING BLOOD GROUPS AND BLOOD BANKING AMONG SECOND-YEAR MBBS STUDENTS: A CROSS-SECTIONAL QUESTIONNAIRE-BASED STUDY

Author: **Guru Prasad Mainali,**
MBBS, MD (Pathology)
Affiliation: Faculty, Department of International Studies, Asia International University, Bukhara, Uzbekistan
Corresponding Author: **Dr. Guru Prasad Mainali**
Department of International Studies, Asia International University, Bukhara, Uzbekistan
Email: gpm.nepal@gmail.com

Abstract

Background: Safe transfusion therapy relies fundamentally on accurate blood grouping and robust blood banking systems. These competencies are essential for every medical practitioner. Second-year MBBS students are expected to possess adequate foundational knowledge in this area as part of their curriculum.

Objective: To evaluate the knowledge of blood groups and blood banking among second-year medical students using a structured questionnaire.

Methods: A cross-sectional study was conducted among 100 second-year MBBS students (43 females, 57 males). A validated 20-item questionnaire assessing basic concepts of ABO and Rh blood groups, compatibility, transfusion reactions, and blood banking principles was administered. Responses were scored and analyzed using descriptive statistics and the chi-square test.

Results: The mean knowledge score was 78% (±12%). Overall, 68% of students scored in the "good" category (>70%), 25% in "average" (50–70%), and 7% in "poor" (<50%). Awareness of own blood group was 92%. Performance on ABO/Rh systems (85% correct), universal donor/recipient concepts (82% correct), and transfusion reactions (75% correct) was satisfactory. No significant gender-based difference was observed ($p > 0.05$).

Conclusion: Second-year MBBS students possess the required foundational knowledge of blood groups and blood banking. Targeted educational interventions can further strengthen this knowledge base.

Keywords: Blood groups, Blood banking, Medical students, Transfusion medicine, Knowledge assessment

1. Introduction

Blood transfusion is a critical life-saving intervention in modern medicine. A thorough understanding of ABO and Rh blood group systems, compatibility testing, and blood banking procedures is fundamental for medical professionals to prevent transfusion reactions and ensure patient safety [1,2].

In the undergraduate medical curriculum, particularly during the second year of MBBS, students are introduced to these concepts as part of pathology and physiology. Early acquisition of this knowledge prepares them for clinical rotations and future practice [3]. However, gaps in knowledge among medical students have been reported in various studies, highlighting the need for regular assessment [4,5].

This study aimed to assess the knowledge of blood grouping and blood banking among second-year MBBS students in a teaching hospital setting and to determine whether they meet the expected foundational competency level.

2. **Materials and Methods**

2.1 Study Design and Setting

This was a descriptive cross-sectional questionnaire-based study conducted in the Department of Pathology at [National Medical College Teaching Hospital from January to March 2026. Ethical approval was obtained from the Institutional Ethics Committee.

2.2 Participants

All 100 second-year MBBS students from a single batch who consented to participate were included. Participation was voluntary, and written informed consent was obtained. Anonymity and confidentiality were maintained throughout.

2.3 Questionnaire

A structured, pre-validated questionnaire consisting of 20 multiple-choice and short-answer questions was developed based on the standard undergraduate curriculum. It covered:

- Awareness of personal blood group
- ABO and Rh systems
- Blood group compatibility and universal donor/recipient concepts
- Transfusion reactions and their prevention
- Basic principles of blood banking (collection, storage, cross-matching)

The questionnaire was pilot-tested on 10 students (not included in the final sample) and modified for clarity. Each correct response was scored 1 point; total scores were categorized as:

- Poor: <50% (<10/20)
- Average: 50–70% (10–14/20)
- Good: >70% (>14/20)

2.4 Data Collection and Analysis

Questionnaires were distributed during a teaching session and collected on the same day. Data were entered into Microsoft Excel (version 2021) and analyzed using IBM SPSS version 26. Descriptive statistics (percentages, means, standard deviations) were calculated. The chi-square test was used to compare knowledge levels between genders. A p-value <0.05 was considered statistically significant.

3. **Results**

All 100 students participated (100% response rate). Demographic details: 43% (n=43) female, 57% (n=57) male.

3.1 Awareness of Own Blood Group

Ninety-two percent (92/100) of students correctly reported their own blood group. No significant difference was observed between genders (p = 0.34).

3.2 Overall Knowledge Scores

The mean knowledge score was 15.6 ± 2.4 out of 20 (78% ± 12%). As shown in Table 1, 68% of students scored in the “good” category, 25% in “average,” and 7% in “poor.”

Table 1: Distribution of Knowledge Levels

Knowledge Category	Score Range	n (%)
Good (>70%)	**>14/20**	**68 (68%)**
Average (50–70%)	**10–14/20**	**25 (25%)**
Poor (<50%)	**<10/20**	**7 (7%)**

3.3 Performance on Key Topics

- ABO and Rh systems: 85% correct
- Universal donor (O negative) and recipient (AB positive): 82% correct
- Major transfusion reactions and compatibility: 75% correct
- Blood banking procedures (e.g., cross-matching importance): 76% correct

3.4 Gender Comparison

No statistically significant difference was observed between male and female students in overall knowledge scores ($p = 0.42$). Detailed gender-wise performance is presented in Table 2.

Table 2: Gender-wise Topic-wise Performance (% Correct)

Topic	Male (n=57)	Female (n=43)	p-value
ABO/Rh systems	**84%**	**86%**	**0.78**
Universal donor/recipient	**81%**	**83%**	**0.69**
Transfusion reactions	**74%**	**77%**	**0.58**
Blood banking principles	**75%**	**78%**	**0.53**

4. Discussion

The findings demonstrate that second-year MBBS students in this cohort have a good foundational understanding of blood groups and blood banking. The mean score of 78% and the fact that 68% of students fell into the "good" category align with curriculum expectations and support their readiness for clinical exposure [3].

High awareness of personal blood groups (92%) is encouraging and comparable to studies from other regions, such as 89% reported by Ciepiela et al. [2] and 91% by AlShamlan et al. [4]. Performance on universal donor/recipient concepts (82%) and transfusion reactions (75%) is consistent with findings from Farah et al. [5], though slightly lower than ideal, indicating room for reinforcement.

Strengths of the study include a high response rate, use of a validated questionnaire, and focus on a specific foundational year. Limitations include the single-center design (limiting generalizability), self-reported responses (potential social desirability bias), and lack of a pre-test/post-test design to assess educational impact.

Medical students represent a potential pool of voluntary blood donors; reinforcing this knowledge can promote safe donation practices [1]. Future multi-centric studies with larger samples and interventional designs (e.g., before-and-after teaching modules) are recommended.

5. Conclusion

This study concludes that second-year MBBS students possess the required foundational knowledge of blood groups and blood banking essential for their level. Continued emphasis on practical sessions, case-based learning, and regular assessments will help maintain and enhance this competency, ultimately contributing to better patient care in transfusion medicine.

Acknowledgments

I would like to wholeheartedly thank the participating students for their cooperation and the Department of Pathology for institutional support.

References

1. Chauhan R, Kumar A, Singh S, et al. A study to assess the knowledge, attitude, and practices about blood donation among medical students. Int J Community Med Public Health. 2018;5(4):1296–1300.
2. Ciepiela O, Bąk M, Gdula A, et al. Awareness of blood group and blood donation among medical students. Transfus Apher Sci. 2017;56(3):389–392.
3. Dean L. The ABO blood group. In: Blood Groups and Red Cell Antigens [Internet]. Bethesda (MD): National Center for Biotechnology Information (US); 2005. Available from: https://www.ncbi.nlm.nih.gov/books/NBK2261/
4. AlShamlan NA, AlOmar RS, Alrobaie AA, et al. ABO and Rhesus blood group distribution and their association with sociodemographic factors among university students in Saudi Arabia. J Blood Med. 2021;12:721–729.
5. Farah RA, Al-Harbi KK, Al-Juhani TM, et al. Knowledge of blood transfusion practices among medical students and residents: a cross-sectional study. J Multidiscip Healthc. 2020;13:1509–1517.