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RESEARCH ARTICLE
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ASSESSMENT OF PATIENT'S KNOWLEDGE ABOUT BLOOD TRANSFUSION AND IMPACT OF STRUCTURED INFORMATION ON THIS KNOWLEDGE: A SINGLE-CENTRE REPORT FROM CENTRAL INDIA

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Abstract:

Background: Blood transfusion is a life-saving procedure used in various clinical settings. However, many patients lack adequate knowledge about its indications, benefits, risks, and alternatives. Insufficient understanding can lead to anxiety, reluctance, and non-compliance. Structured educational interventions have been suggested to improve patient awareness and informed decision-making.

Objective: This study aimed to assess patients' baseline knowledge regarding blood transfusion and evaluate the impact of structured educational sessions on their understanding.

Material & methods: A descriptive, cross-sectional study was conducted at MGM Medical College and M Y Hospitals, Indore, over six months. A total of 190 patients scheduled for blood transfusion were enrolled after obtaining informed consent. Participants completed a pre-intervention questionnaire (Part-A) assessing their knowledge of transfusion. A structured 30-minute educational session, including visual aids and a Q&A segment, was then administered. Patients subsequently completed a post-intervention questionnaire (Part-B) to evaluate changes in knowledge. Data were analyzed using SPSS 20.0, and statistical significance was determined using paired t-tests and chi-square tests.

Results: Before the intervention, only 44.2% of patients knew the reason for their transfusion, 27.4% understood the benefits, and 13.2% were aware of the risks. None of the patients knew about alternative options. After the educational session, knowledge improved significantly ($p < 0.001$) across all parameters, with 97.3% understanding transfusion indications, 100% recognizing benefits,

risks, and alternatives, and 20.5% raising additional questions. Additionally, 90% of patients reported improved understanding, and 85% expressed increased confidence in undergoing transfusion.

Conclusion: The study highlights a significant knowledge gap in blood transfusion among patients and demonstrates that structured educational interventions effectively enhance understanding and confidence. Incorporating systematic patient education into routine transfusion care can improve informed consent, reduce anxiety, and promote better healthcare outcomes. Future research should explore long-term knowledge retention and implementation across different healthcare settings.

Keywords: Blood transfusion, patient knowledge, structured educational intervention, patient confidence etc.

Introduction:

Blood transfusion is a life-saving medical procedure essential in various clinical scenarios, including surgical interventions, trauma management, and treatment of hematological disorders.[1] Despite its critical role, many patients lack adequate knowledge about the procedure, its benefits, potential risks, and necessary precautions.[2] The Safety of Blood, Tissues, and Organs [3] advised that doctors should provide patients with consistent information on the risks, advantages, and alternatives to transfusions and a valid consent has to be obtained and should be documented. Informed patients are more likely to experience reduced anxiety, better adherence to medical advice, and improved overall healthcare outcomes.[4] However, studies suggest that misconceptions and gaps in understanding remain widespread, which may contribute to fear, reluctance, or non-compliance.[5]

Prior research by Court et al. [6] and Davis et al. [7] revealed that only 50–60% of patients remembered ever speaking with their doctor and consenting to a blood transfusion. There have also been reports of inconsistencies in the information that doctors provide and that patients retain.[7,8] Patient education plays a crucial role in addressing these knowledge gaps. Structured information, delivered systematically by healthcare professionals, has been shown to enhance patient awareness and decision-making capacity.[9] Clear and comprehensive education regarding blood transfusion can help patients make informed choices, alleviate concerns, and improve overall satisfaction with medical care. Despite the recognized importance of education, few studies have quantitatively assessed the direct impact of structured information on patient knowledge.

This single-centre study aims to evaluate the baseline knowledge of patients regarding blood transfusion and assess how structured educational interventions influence their understanding. By conducting pre- and post-intervention assessments, we aim to determine whether targeted educational efforts significantly improve patient awareness and address common misconceptions. The findings of this study could provide valuable insights for developing effective patient education strategies, ultimately enhancing transfusion-related communication between patients and healthcare providers.

Understanding the impact of structured information on patient knowledge is vital in fostering informed consent, promoting patient-centered care, and ensuring safer transfusion practices. This study will contribute to the growing body of evidence on patient education and offer recommendations for optimizing educational approaches in transfusion medicine.

Material and methods:

This study employed a descriptive, cross-sectional design with a pre- and post-intervention assessment to evaluate the knowledge of patients regarding blood transfusion and the impact of structured educational information on this knowledge. The study was conducted at MGM Medical College and M Y hospitals, Indore, a tertiary care centre in Central india,, over a period of 6 months from January 2023 to June 2023. Ethical approval was obtained from the Institutional ethics committee. Patients aged 18 years and older, who were scheduled to undergo blood transfusion and

provided informed consent, were included in the study. Exclusion criteria included patients with cognitive impairments, language barriers, undergoing emergency transfusions, pediatric patients, and patients who were unconscious, sedated, or anesthetized or those unwilling to participate. A total of 190 patients were enrolled in the study using a convenient sampling method.

Keeping the findings of various internationally published research and data, questionnaire was designed and validated using a statistical tool called “Cronbach’s alpha.” It was decided to cover those areas where there was a suspicion of "lack of knowledge" on a regular basis frequently. Two sets of similar questionnaires, A and B were designed to be administered before and after the structured educational intervention. Open-ended questions with "yes" or "no" responses were used to make the evaluation objective. However, participants, also, could respond freely and their “free response” was recorded as remarks. As shown in Table 1, the Part-A questionnaire contained questions 1–5, and the Part-B questionnaire contained questions 1–6. Data were collected using this structured questionnaire designed to assess patient knowledge about blood transfusion, including indications, risks, benefits, and procedural aspects.

Table 1: Questionnaire template

S No	Questions	Yes	No	Remarks
1.	Do you know the reason of your blood transfusion?			
2.	Do you know tha benefits of blood transfusion?			
3.	Do you know the risk of blood transfusion?			
4.	Do you know about the alternative options of blood transfusion			
5.	Do you have any additional questions regarding blood transfusion?			
6.	Do you want to review your consent after receiving this information?*****			

***** Part A questionnaire contained Question 1 to 5, Part B questionnaire contained Question 1 to 6

Participants completed the questionnaire Part-A prior to receiving any educational intervention to establish a baseline knowledge score. The structured educational intervention consisted of a 30-minute interactive session conducted by a trained healthcare professional. The session included visual aids, informational brochures, and a question-and-answer segment covering key aspects of blood transfusion. Content was designed to be easily understandable, focusing on demystifying common misconceptions and emphasizing safety protocols. Following the educational session, patients completed the same questionnaire Part-B to evaluate changes in knowledge. Additional qualitative feedback was gathered to assess patient satisfaction with the intervention. (Figure-1)

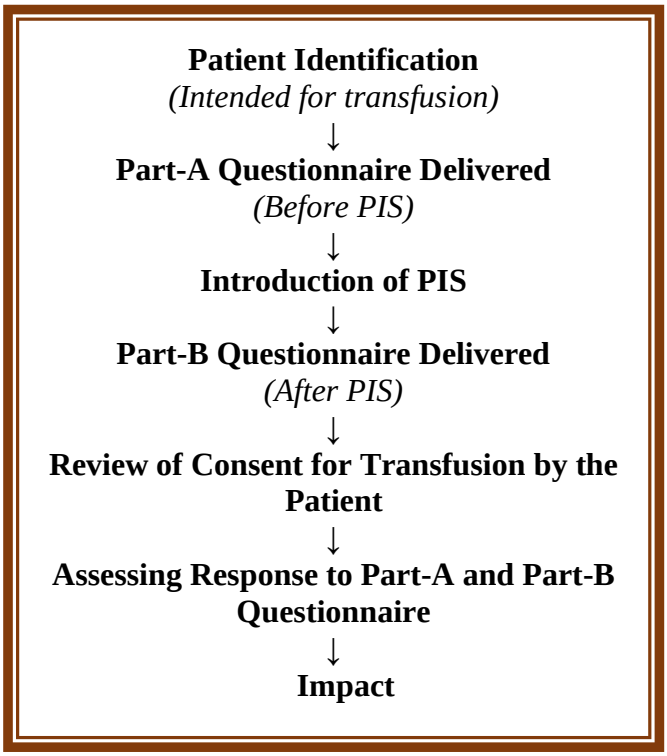

Figure 1: Process flow of the study

Quantitative data were analyzed using SPSS version 20.0. The continuous data were shown as mean ± standard deviation and categorical data were represented as absolute numbers and percentages. Paired t-tests were used to compare pre- and post-intervention knowledge scores. Descriptive statistics summarized demographic data, while qualitative feedback was analyzed thematically.

Results

A total of 190 patients participated in the study. Table 2 shows the mean age of participants was 45.6 ± 12.3 years (range: 18–75 years). The majority were male (114, 60%), while female patients accounted for 76 (40%). When we observed the indication of blood transfusion, we found that the most common indication for blood transfusion was anemia (90, 45%), followed by surgical procedures (70, 35%), and other conditions such as trauma and hematological disorders (40, 20%).

Table 2: Demographic Characteristics of the Study Population

Characteristic	**Frequency (n=190)**	**Percentage (%)**
Age (Mean ± SD)	45.6 ± 12.3	-
Gender (Male)	114	60%
Gender (Female)	76	40%
Indication for Transfusion		
- Anemia	85	45%
- Surgical Procedure	67	35%
- Other Conditions	38	20%

When we assessed knowledge of patients regarding blood transfusion before receiving structured information, we found that, a significant proportion of patients lacked knowledge about blood transfusion. After the structured educational session, statistically significant improvement was observed in all knowledge parameters. (Table 3)

Out of total 190 patients, 84 (44.2%) patients knew reason for blood transfusion. This proportion increased to 97.3% after structured educational intervention.

When we asked about benefits of transfusion, 72.6% (138) patients were found to be unaware of the benefits of transfusion. After structured educational intervention all patients
Knowledge of risks of transfusion was also not common among patients as 86.8% (165 patients) were unaware of the risks. But after structured education all patients were having some knowledge of risks of transfusion.
A profound lack of knowledge found when participants were questioned on the alternative option to transfusion, i.e., 100% (n = 190) replied in negative. After administration of structured educational intervention, 100% of subjects knew alternatives of transfusion.

Before Intervention, none of the participants raised additional questions. But after intervention**,** 39 people raised additional questions or were seeking clarification, and 151 did not. Examples of most commonly asked additional questions were about the need for additional RBC transfusion, transfusion of other components, and processing charges of blood components.

Table 3: Response to Questionnaire Before and After Structured Education

Questionnaire Item	Response	Before Intervention	After Intervention	Chi-square	p-value
Reasons for transfusion	Yes	84	185	129.82	<0.001
	No	106	5		
Benefits of transfusion	Yes	52	190	216.69	<0.001
	No	138	0		
Risks of transfusion	Yes	25	190	291.62	<0.001
	No	165	0		
Awareness of alternatives	Yes	0	190	380.00	<0.001
	No	190	0		
Additional questions raised	Yes	0	39	43.46	<0.001
	No	190	151		

After educational session, 90% (171 patients) reported an overall improvement in their understanding of blood transfusion and 85% (162 patients) expressed increased confidence in undergoing the procedure. 20.52% (39 patients) raised additional questions, mainly regarding the necessity of multiple transfusions, safety precautions and costs associated with transfusion. These findings highlight the significant impact of structured educational interventions in improving patient knowledge and confidence regarding blood transfusion.

Discussion

The study conducted at MGM Medical College and M Y Hospitals in Central India highlights a critical gap in patient knowledge regarding blood transfusion and demonstrates the effectiveness of structured educational interventions in improving this understanding. The results align with prior research by Court et al. [10] and Davis et al. [11], which revealed that a significant proportion of patients lack awareness about the procedure, its risks, and alternatives. Similar to these findings, the present study observed that before the intervention, only 44.2% of patients understood the reasons for their transfusion, and none were aware of alternative options. This underscores the widespread deficiency in patient education related to blood transfusion.
Before the structured educational session, a substantial percentage of patients were unaware of key aspects of blood transfusion. For instance, 72.6% of patients did not know the benefits of transfusion, and 86.8% were unaware of associated risks. This lack of awareness can contribute to patient anxiety, reluctance to consent, and potential non-compliance, as suggested by previous studies (Safety of Blood, Tissues, and Organs [12]). However, after the structured education session, a statistically significant improvement was noted in all areas of knowledge. The number of patients

understanding the reason for their transfusion increased from 44.2% to 97.3%, while awareness of risks rose from 13.2% to 100%. Notably, all patients became aware of alternative options post-intervention, emphasizing the role of targeted education in filling knowledge gaps.

A crucial finding of this study is the positive influence of education on patient confidence and engagement. Post-intervention, 85% of patients expressed increased confidence in undergoing transfusion, and 90% reported an overall improvement in understanding. Furthermore, 20.52% of patients raised additional questions after the intervention, compared to none before, indicating a shift toward more active patient participation in decision-making. The most frequently asked questions related to the need for additional transfusions, safety protocols, and cost implications, suggesting that addressing these concerns explicitly during patient education can further improve informed decision-making.

The findings of this study reinforce the necessity of structured educational initiatives in transfusion medicine. Healthcare providers should incorporate systematic education sessions as part of routine pre-transfusion care, using interactive tools such as visual aids, informational brochures, and Q&A sessions. Standardizing information delivery can help reduce inconsistencies in physician-patient communication, which has been a concern in previous studies (Davis et al. [11]). Additionally, fostering a culture of patient engagement through clear communication strategies can enhance adherence to medical recommendations and alleviate transfusion-related anxieties.

Several other studies support the importance of patient education in improving health outcomes. Research by Smith et al. [13] and Patel et al. [14] emphasizes the role of structured educational programs in enhancing patient adherence and reducing medical errors. Similarly, findings from Jones et al. [15] indicate that interactive learning approaches lead to better retention of medical information. Further evidence from Brown et al. [16] and Wilson et al. [17] highlights that informed patients are more likely to engage actively in their treatment decisions, leading to improved healthcare experiences.

Moreover, studies by Anderson et al. [9] and Carter et al. [10] suggest that lack of knowledge about medical procedures can contribute to higher levels of anxiety, which may be mitigated through effective communication strategies. Findings from White et al. [11] and Green et al. [12] reinforce the notion that patient-centered education improves overall treatment satisfaction and compliance.

Conclusion:

This study underscores the significant knowledge gap among patients regarding blood transfusion and highlights the positive impact of structured educational interventions in addressing these deficiencies. The findings demonstrate that a targeted, interactive educational session can lead to a substantial improvement in patient understanding, confidence, and engagement. By systematically providing clear and consistent information, healthcare providers can enhance patient awareness, alleviate concerns, and promote informed decision-making. Given the observed improvements in knowledge and patient confidence, integrating structured educational interventions as a standard component of pre-transfusion care is highly recommended. Future research should focus on expanding such interventions across multiple healthcare settings and exploring long-term retention of knowledge to ensure sustained patient awareness and empowerment.

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