

# Assessment of Knowledge, Attitude and Practice of Donors Towards Blood Donation and Outcome of an Intervention to Change the Behavior of Donors- A Systemic Review

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## Abstract

**Introduction:** Blood donation is a remarkably safe medical procedure; however, it is affected by attitudes, beliefs, and knowledge level. Nevertheless, blood is a veritable tool in many life-saving situations. Despite the increased demand for blood, the supply of safe blood has been inadequate. Although blood is the essence of life, and is one of the most precious donations; blood transfusion services are facing shortage of blood all over the world. A significant percentage of people have false beliefs about blood donation. Increase in the level of knowledge and correction of false beliefs should be the top most priority. Therefore, studying factors contributing to their knowledge, attitude and practice of blood donation is essential. There are studies that investigated the effectiveness of interventions or procedure changes in blood donation settings on outcomes including donor deferral, disclosure of risk factors, and rates of errors and omissions. Researchers also identified several interventions to improve donor compliance that have been tested in blood donation settings and provided evidence for the effectiveness of computerized interviews in improving detection of risk factors. Interventions can utilize the processes of change (POC) measure to guide stage matched interventions to encourage use of relevant experiential and behavioral strategies to increase blood donation. Interventions to recruit and retain blood donors in the general population have been classified into six approaches: motivation, reminders and commitments, altruism, measurement of cognitions, incentives, cognition based. Effective recruitment and retention are two different processes and may require different approaches. For example, retention may be influenced more by interventions that focus on actions during or after donation rather than interventions prior to the blood donation appointment. Educational intervention was effective in improving the knowledge and attitude towards voluntary blood donation among medical students. Continuous enlightenment will influence potential blood donors to have better knowledge and positive attitude toward voluntary blood donation.

**Keywords:** Blood donation, attitudes, beliefs, knowledge, safe blood, blood transfusion, donor deferral, donor compliance, educational intervention.

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## INTRODUCTION

Blood is a particular body fluid that transports nutrients and oxygen to the cells and moves away the metabolic wastes from the cells. Its transfusion from generous donors is an indispensable part of modern health care which can save lives and improve health. But transfusion of infectious agents carries potential risks up on the receiver demanding particular attention [1,2]. Across the globe, over 80 million units of blood are being

donated a year of which only two million in Sub-Saharan Africa where the demand is high.

Blood is the most donated tissue in medical practice and used as a veritable tool in many lives-saving medical conditions if used appropriately. Blood is essential to life, circulates through the body, and delivers essential substances such as oxygen and nutrients to the body cells and removes metabolic waste products from the body cell [3]. Blood is given to restore lost blood and

to improve the ability of the blood to deliver oxygen to the body tissues. The importance of blood transfusion in medical practice cannot be overemphasized as millions of lives have been saved since the discovery of ABO blood groups [4]. Despite advances in medical research, an ideal substitute for blood is yet to be found, hence blood donation is still the only viable option for persons with different medical conditions that require blood transfusion [5]. There has been increasing demand for blood transfusion, particularly in developing countries, due to injuries sustained following road traffic accidents, obstetric-related blood loss, surgical emergencies, and various medical conditions that necessitate blood transfusion [6]. Blood transfusion is an important component in improving health care and prevention of the spread of infectious diseases worldwide [7]. Each year, millions of lives are saved through blood transfusion, but the quality and safety of blood transfusion are still the interest especially in the developing countries [2,8].

Availability of safe blood is an increasing need particularly for those who keep up serious traumas whether accidental or surgical in nature and those who are exposed to civil conflicts and military operations. In addition, some patients suffer severe anemia due to various reasons and may need blood transfusion [9]. Authors also stated that both developed and developing countries have problems with the unpaid blood donation system [10]. Young people are the most probable blood donors in every society and students compose a large portion of them [11]. All blood components and manufactured blood products originate from blood donors, so the safety of blood transfusion begins with careful selection of donors. An adequate and reliable supply of safe blood can be assured by a stable base of regular, voluntary, unpaid blood donors, who are the safest group of donors as the prevalence of blood-borne infections is lowest among these donors [12]. In spite of the relevance of blood donation, the major challenge to the transfusion of blood is meeting the increasing demand for blood and ensuring its constant supply.

Education is an important aspect of a donor recruitment strategy. Donor education, motivation, and recruitment campaign has three basic goals: (i) to promote changes in the public's knowledge, attitudes, and beliefs so that they understand why blood donation is a vital, life-saving service to the community; (ii) to promote changes in people's behavior so that they become willing to donate blood voluntarily on regular basis without payment; and (iii) to ensure that potential donors understand the importance of safe blood donation so that they do not donate blood if they are in poor health or at risk of transmitting transfusion transmissible infections (Sachdev S *et al.*, 2015) [13]. Students constitute an important resource globally. Medical students are future doctors and are in a strategic position to enlighten and serve as role models to the general population as regards voluntary blood donation [14].

Assessing their knowledge and attitude toward blood donation will help to identify gaps. Intervention in the form of blood donor education and enlightenment will address the identified knowledge gaps with subsequent improvement in willingness to donate blood regularly. Therefore, this study was to determine the effect of blood donor educational intervention on the knowledge and attitude of medical students toward voluntary blood donation. Ugwu NI *et al.*, (2020) emphasized that medical students have good baseline knowledge and positive attitude toward blood donation at baseline, and this further improved after blood donor education intervention [14]. Therefore, there is a need for recurrent blood donor education among potential blood donors to ensure a sustained pool of voluntary blood donors. Considering the facts and figures, the present review is aimed to evaluate the assessment of knowledge, attitude and practice of donors towards blood donation and outcome of an intervention to change the behavior of donors. The aim of this review is to investigate factors influencing individuals' knowledge, attitudes, and practices regarding blood donation, with a focus on identifying effective interventions to increase blood donation rates.

### Objectives

The main objective of this study to review the assessment of knowledge, attitude and practice of donors towards blood donation and outcome of an intervention to change the behavior of donors.

## METHODOLOGY & MATERIALS

### Study Design:

This review was conducted using PRISMA guidelines. The review consisted of 5 steps: (1) problem identification; (2) literature searching; (3) data review and evaluation; (4) data synthesis and analysis; and (5) data presentation.

### Search Method:

The current review performed a search for relevant articles in electronic databases: PubMed, Google Scholar and Medline. Databases were searched for studies published in all years up to that examined interventions used to increase blood donor compliance. Citation titles and abstracts were screened for relevance, and publications identified as potentially relevant were retrieved in full text. Full-text articles were examined to determine whether they met the eligibility criteria as outlined below. The reference list of each article was searched manually for other potentially relevant articles. The following keywords were used: Blood donation and Intervention. All the articles that reported the outcome of an intervention to change the behavior of donors toward blood donation in the English language were included. Case reports, abstracts, letters, publications written in languages other than English, and comments were not included.

**Data Collection:**

All types of intervention to change the behavior of donors toward blood donation were included in the present review. We retrieved the following data regarding each study: study type, sample size, interest of blood donation, intervention, outcome. The results were measured for those who believe that there are many risks in donating blood and who have no idea about donating blood. Such as lack of knowledge, thinking it was harmful for health, chronic disease, anemia, infection and never having being connected to give blood.

We investigated all articles included in the present review that intervention to improve knowledge

and change donors' behavior toward blood donation. There are several interventions were classified into six approaches: 1. Motivation, 2. Reminders and commitments, 3. Altruism, 4. Measurement of cognitions, 5. Incentives, 6. Cognition based.

The search resulted in 108 articles which were identified in the initial databases (Figure 1). After duplicates were removed, 83 articles remained. Of these, 55 were excluded based on titles and abstracts screened; 18 full articles were excluded for not meeting inclusion criteria. Finally, 10 publications met the criteria and were included in this review.

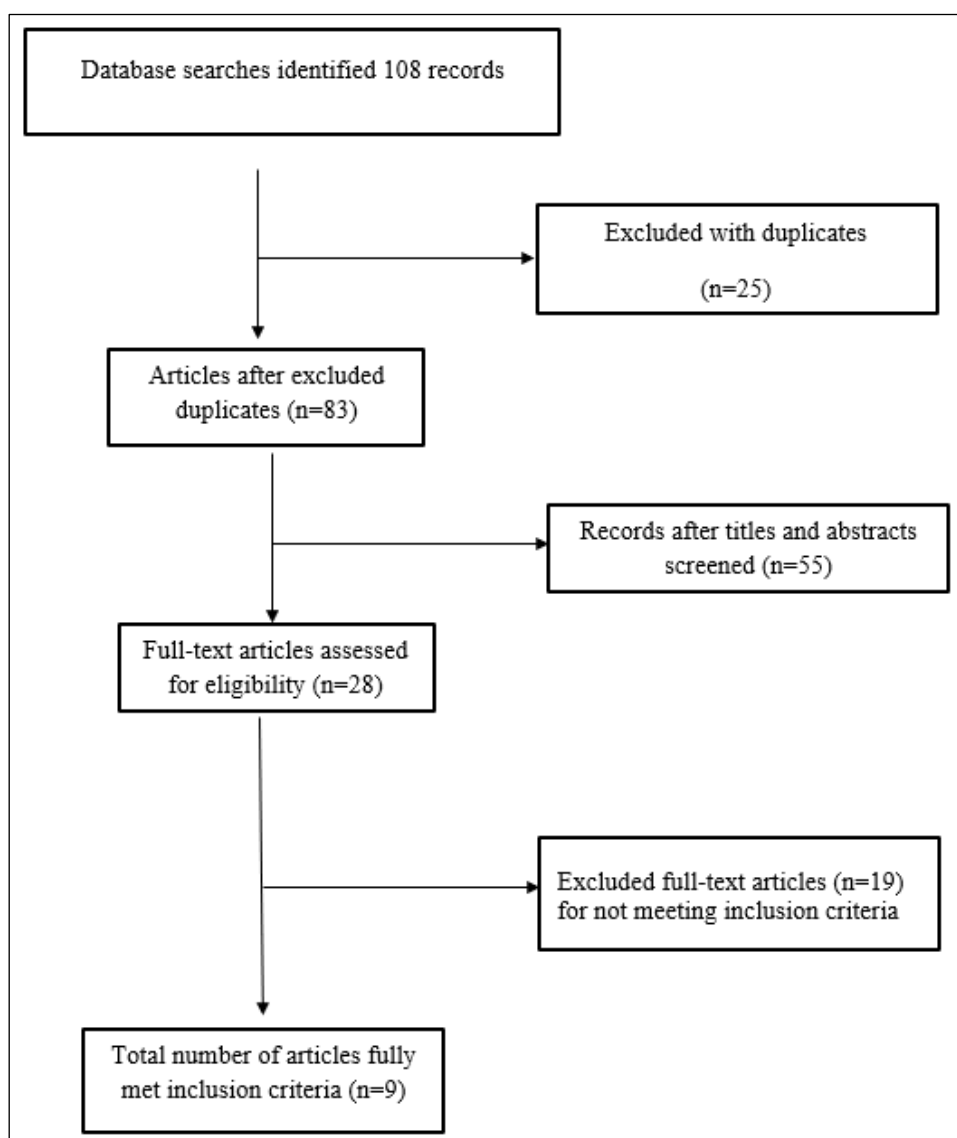


Figure 1: Flow chart of systematic review of literature selection process for the present research

**RESULT**

In the present review, we included 9 papers: one was a cohort, one was a case series, one was a non-randomized, experimental trial, one was a prospective-randomized, one was a cross-sectional, one was a randomized control trial, one was an experimental

randomized-control trial, one was a KAP and one was not specified (Table 1). The total number of patients was 40,218.

All interventions could be classified as using motivational and (cognitions-based) techniques [15-

17,22,23], Some studies also reported using other motivational techniques: altruism [16,17,23] two studies reported using motivational techniques: reminders [15,18], two studies reported using motivational techniques: incentive [19,21] one study reported using measurement of cognitions [20].

All nine trials reported positive outcomes in blood donation and/or intention to donate. Seven trials found that the intervention increased presentation for donation; Two found an increase in the percentage of new donors. Most trials focused on short-term outcomes (i.e., mainly measured immediately following the intervention) and thus the long-term impact of interventions is unclear.

In 2017, Bachegowda *et al.*, [15] performed a cohort study of 18638 donors on the effectiveness of a recruitment e-mail and video link tailored specifically to African American potential donors, compared with generic versions of the same materials.

In a case series study conducted in France, by Grassineau *et al.*, [16] the medical members of the Comorian community, it was proposed that the population be sensitized to the gift of blood. The donors present themselves spontaneously without community pressure. The infectious markers rate was then equal to the general blood donor population's rate.

Price *et al.*, [17] conducted a non-randomized, experimental trial including approximately 15,000 people. This study also reported using motivational techniques: altruism and targeted new donors. This study reported on multifaceted, community-based interventions. These included a variety of repeated activities in target communities, most including a media component.

In a prospective- randomized trial of blood donors (n= 692) in China, Hu *et al.*, [18] this study reported a higher re-donation rate after the web-based

video intervention. The repeat donors' improved blood donation anxiety, outcome expectations, and cognition of the blood donation environment after the intervention were significantly higher than those of the nonrepeat donors.

Salaudeen and Odeh [19], conducted cross-sectional research that engaged students in Nigeria in voluntary blood donation. This research also documented the use of motivating strategies, including incentives. T-shirts and wristbands motivated responders to donate blood.

Godin *et al.*, [20] performed a randomized-control trial of novice blood donors (n= 692) in Canada. This study intervention used to answer questions about cognitions related to blood donation to increase this behavior.

Jason *et al.*, [21] the study reported interventions used incentives, such as gift certificates, prizes, free meals, and others, to increase blood donation. The intervention did not report the exact number of study participants but stated that the intervention was successful in increasing blood drive attendance.

Sarason *et al.*, [22] conducted an experimental randomized-control trial including 97 blood donors in Seattle. The intervention was characterized as motivating. However, the intervention did not indicate the number of participants in their samples, therefore it was omitted from the study. Sarason *et al.*, found that motivational intervention was increased blood drive attendance significantly (P <.01).

Mousavi *et al.*, [23] conducted in Tehran, Iran in 2011 on 1000 donors. This study reported ninety-five percent of people have stated that their main motivation to donate blood was altruism. Altruism and being encouraged by others had the leading roles in peoples' positive attitude towards blood donation.

**Table 1: Summary of the published articles**

Reference	Study design	Sample size (n)	Intervention type	Outcome
Bachegowda <i>et al.</i> , [15] 2017, USA (New York)	Cohort	n= 18,638	Motivational (cognitions-based); reminders	Return presentation for donation
Grassineau <i>et al.</i> , [16] 2007, France (Marseilles)	Case series	Not specified	Motivational (cognitions-based, altruism)	Volunteering for blood donation
Price <i>et al.</i> , [17] 2009, USA (Missouri, St. Louis)	Non-randomized, experimental trial	n=approx. 15,000 people	Motivational (cognitions-based, altruism)	Percentage of first-time blood donors
Hu <i>et al.</i> , [18] 2022, China	Prospective-randomized trial	n= 692	Motivational; (reminders)	Higher redonation rate
Salaudeen & Odeh, [19] 2011, Nigeria	Cross-sectional	n=400	Motivational (Incentive)	Volunteering for blood donation
Godin <i>et al.</i> , [20] 2010, Canada	Randomized-control trial	n= 4391	Measurement of cognitions	Repeat donations among novice blood donors

Reference	Study design	Sample size (n)	Intervention type	Outcome
Jason <i>et al.</i> , [21] 1986. Chicago	Not specified	Not specified	Motivational (Incentive)	Increasing blood drive attendance
Sarason <i>et al.</i> , [22] 1991, Seattle (Washington)	Experimental randomized-control trial	n= 97	Motivational	Increasing blood drive attendance
Mousavi <i>et al.</i> , [23] 2011, Iran	KAP	n= 1000	Motivational (measurement of cognitions based, altruism)	Positive attitude towards blood donation

## DISCUSSION

According to our review, the first studies reporting interventions to increase blood donation were published in the 1970s. When we look at the flowchart (see Fig 1), this phenomenon does not seem to originate from the fact that many interventions did not report a behavioral outcome.

Previous studies [15,18], highlighted the effectiveness of reminders, such as telephone calls, e-mail, web-based video in informing blood donors about the specifics of upcoming blood drives, including the time, date, and location. Furthermore, a recent investigation among first-time donors demonstrated that receiving a telephone reminder about the upcoming chance to donate blood leads to a higher rate of return donors, who also return more promptly compared to those who do not receive such calls. These telephone calls serve as a "cue-to-action," serving as environmental prompts to remind individuals to engage in a particular behavior.

In this current review, cognition-based interventions encompassed all strategies aimed at addressing psychosocial factors underlying motivation, such as social norms, attitudes, and barriers [17]. The efficacy of such interventions in boosting blood donations further validates earlier findings suggesting that intention, which reflects one's motivation towards a particular behavior, is a significant determinant of blood donation [16,17].

Altruism-based interventions appeared to effectively motivate individuals to donate blood. However, it's important to interpret this finding cautiously due to challenges in quantifying efficacy. Previous reviews [16,17], have already highlighted that altruistic motives are commonly cited by most blood donors as their primary reason for donation. Additionally, it has been suggested that women and young people are particularly responsive to appeals based on altruism [17]. Hence, considering that many interventions were tested on college student samples, with slightly over half of these samples comprising female students, this could explain the effectiveness of such interventions. However, it remains to be investigated whether appeals to altruism are similarly effective among older male populations.

Interventions incorporating the measurement of cognitions were also found to be effective in boosting attendance at blood drives. The influence of such interventions on behavior is commonly referred to as the question-behavior effect or the mere-measurement effect. As per the question-behavior effect, posing questions regarding pertinent cognitions can indeed lead to behavioral changes [20]. It's unsurprising that only three studies were found in this category, considering that the research on the question-behavior effect is still relatively new; it's only recently that such an effect has been observed in the context of blood donation [20]. Therefore, it will be crucial to gather further insights into the specific types of questions that prompt action, as well as the potential factors that may moderate this effect (such as individuals' level of experience with blood donation).

It is important to note that incentives were sometimes utilized alongside other intervention components, such as appealing to altruistic motives or providing T-shirts. We included the study that have suggested that there is scant evidence supporting the efficacy of incentives like money, prizes, or similar tokens in increasing blood donation [19,21]. In fact, there is even evidence suggesting that they might potentially reduce donations by diminishing altruistic motives to donate blood [21].

Unfortunately, very few interventions were developed to target a specific type of donors (eg, novice donors, regular donors, etc.). This is rather surprising given that previous studies have clearly shown that the motives for giving blood differ between types of donors. For example, it has been shown that the determinants of return to give blood again differ between novice and experienced donors [20]. This would suggest that different interventions should be developed for first-time, novice, experienced, and regular donors. The present review that indicated that interventions among novice donors are effective could not be compared with those of other types of donors. Moreover, most interventions were carried out among samples of college students, thereby making the results hard to generalize to the general population.

### Limitations of the study

The present review has some limitations that are worth mentioning. First, the relatively small number of studies prevented. Only studies written in English were



included in this analysis, and relevant literature in other languages was not considered.

## CONCLUSION AND RECOMMENDATIONS

The present review contributes to improve current knowledge, to identify gaps in knowledge, and the effectiveness of interventions aimed at changing donor behavior. By addressing these factors, interventions can increase donation rates and sustain a safe blood supply. Continuous evaluation is crucial for refining strategies and ensuring long-term success in promoting blood donation behavior change.

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