Blood Donors’ Perceptions, Motivators and Deterrents in Sub-Saharan Africa – A Scoping Review of Evidence

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**TITLE**

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**Short Title**

Blood Donors’ Perceptions, Motivators and Deterrents in SSA

# Summary

Achieving an adequate blood supply in Sub-Saharan Africa (SSA) through donor mobilization and retention is crucial. Factors that motivate or deter blood donors vary according to beliefs and social norms. Understanding the factors that influence blood donation behaviour in SSA is vital to developing effective strategies to address blood donor motivation and retention. This review of 35 studies from 16 SSA countries collates available evidence concerning the perceptions, motivators and deterrents that influence blood donors in SSA. The review revealed a common understanding that blood and blood donation save lives. The main deterrent to blood donation was fear due to lack of knowledge and discouraging spiritual, religious and cultural perceptions of blood donation. Altruism, donating blood for family, and incentives were the main motivators for blood donation. The findings support the need for targeted, culturally sensitive education, recruitment, and retention strategies to improve the blood supply in SSA.

**Key words**

blood donor, perceptions, motivators, deterrents, Sub-Saharan Africa

# Introduction

Blood collection agencies worldwide are increasingly faced with the problem of recruitment and retention of adequate numbers of blood donors. In high-income countries (HIC), this has been attributed to difficulty in retaining young donors to replace the ageing donor population (France et al., 2013), increasing demand for blood, and increasing donor deferrals on medical grounds among others (Custer et al., 2005). Lack of blood donors in sub-Saharan African (SSA) countries on the other hand, is due to factors such as, lack of well-established structures for provision of blood service; poor infrastructure and logistics for blood donor recruitment and retention; widespread populations, many of whom live in rural areas with poor access to blood centres and poor communication networks; high prevalence of Transfusion Transmissible Infections (TTI); misperceptions about blood and blood donation due to lack of knowledge and cultural influences; and resource constraints (Reddy, 2012; Salaudeen et al., 2011; Tapko et al., 2014). Consequently, the median blood donation rate per 1,000 population in HIC is 33.1, compared with 11.7 in middle-income countries and 4.6 in low-income countries (WHO, 2016).

This translates into an inadequate supply of safe blood for transfusion which is a major challenge to healthcare provision in low- and middle-income countries (LMIC). In SSA, blood transfusion is usually an emergency treatment for severe anaemia of varying aetiology, and lack of blood supplies is a major factor in preventable deaths among women and children (Bates et al., 2008). SSA has the highest maternal mortality in the world with a Maternal Mortality Ratio (MMR) of about 546 per 100,000 live births. SSA accounts for 201,000 of the 303,000 maternal deaths in the world in 2015 ; of these 37.6 to 44% of maternal deaths are attributable to haemorrhage and anaemia (Khan et al., 2006; WHO, 2015). Up to 50% of transfusions given to children are for treatment of malaria-associated anaemia (Khan et al., 2006). Under-five mortality rates and the prevalence of malaria are high, with considerably high mortality due to severe malaria and anaemia (Marsh et al., 1995; Tapko et al., 2009). Other conditions such as road traffic accidents, sickle-cell anaemia, HIV, and anaemia induced by anti-retroviral therapy are also frequent reasons for blood transfusion in SSA (Lagarde, 2007).

## Blood Donation in Low and Middle Income Countries Compared to High Income Countries

In HIC, about 99.7% of blood donation is by voluntary non-remunerated donors (VNRD) who donate blood by their own free will and without receiving in return any payment in cash or in kind which could be considered a substitute for money (WHO, 2012). Conversely, in the African Region family and/or replacement donors (FRD), who donate blood only in response to need by a patient who is known them, are the main source of blood and provide about 60-90% of the total blood supply (Allain et al., 2010; WHO, 2008). FRD may include hidden paid donors (PD), that receive remuneration, often monetary, from patients’ relatives for donating but present as FRD.

WHO advocates the collection of blood from repeat VNRD, as key to an adequate, safe and sustainable blood supply (WHO/BTS, 2009). The WHO African Regional Strategy, adopted in 2001, aimed to assist countries in the African Region to set up effective systems of recruitment of low-risk, voluntary, regular donors and to achieve 80% VNRD in the donor population by 2012 (WHO, 2001). Using a donation rate of 1% of the population, the WHO estimated that the blood requirement for the 46 member states in the African Region in 2010 was about 8.13 million units. However, in that year, only about 3.48 million units were donated in the region, leaving a deficit of about 4.65 million (Tapko et al., 2014). Blood from FRD in many SSA countries serves as an alternative for, or to supplement insufficient numbers of VNRD.

Evidence has demonstrated that blood from VNRD is safer and has lower a incidence of TTI seroreactivity than that from FRD (Clark et al., 2005; Sarkodie et al., 2016). However, even in this setting, the safest type of donor is one who donates repeatedly (Allain et al., 2010).

Achieving an adequate blood supply in SSA through donor mobilization and retention is crucial. Blood donor behaviour studies from HIC (Ferguson et al., 2007; Masser et al., 2008) and the resultant knowledge of blood donor motivation and psychology, have facilitated the establishment of a reliable blood supply from VNRD in these countries. Similarly, in SSA, blood collection is locally driven and strategies have been put in place by a number of blood collection organizations to address the inadequate blood supply (Allain et al., 2008; Basavaraju et al., 2010; Dahourou et al., 2010; Owusu-Ofori et al., 2010; Reddy, 2012). However, as the blood donation deficit described above demonstrates, these strategies have only been successfully implemented in very few countries. The blood donor recruitment models in SSA have largely been based on those designed and used in different, more wealthy contexts; and where these have not worked, modifications have been implemented. In addition, the evidence for such strategies and methods of their evaluation may sometimes be inadequately described. To illustrate this, in a systematic review of the efficacy of interventions promoting blood donation by Godin et al., (2012), not a single study from SSA was included. Beliefs, social norms and perceived behavioural control have been found to influence blood donation behaviour (Ajzen, 1991). Since these constructs vary between HIC and LMIC, factors that motivate or deter blood donation may also vary between HIC and LMIC in accordance with beliefs and social norms. Therefore, understanding the factors that influence blood donation behaviour in SSA is vital to developing local, culturally sensitive strategies to address blood donor motivation and retention.

The purpose of the following literature review on blood donor motivation in SSA is to highlight the available evidence on, and to identify, the perceptions, motivators, and deterrents that influence blood donation behaviour in SSA; and identify how these factors influence blood donation in SSA.

Methods

## Study Design

A study protocol was developed based on a scoping review framework (Arksey and O’Malley, 2005) and the Methodology for JBI Scoping Reviews (The Joanna Briggs Institute, 2015). Identified studies were selected for the review using the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) of health care interventions (Moher et al., 2009). Data extraction and a thematic analysis were conducted using “the framework method for analysis of qualitative data” (Gale et al., 2013). A coding scheme based on the taxonomy of blood donor motivators (Bednall and Bove, 2011), but modified to capture the perceptions of blood and blood donation found in SSA blood donors was used for reporting the results.

## Inclusion Criteria

**Type of participants**

The review considered studies that included persons from SSA who have donated blood before, who have never donated blood or who have experiences about blood donation.

**Concept**

The review considered quantitative, qualitative, mixed-method and case studies that examined attitudes, perceptions, motivations and deterrents to blood donation.

**Context**

The review considered studies conducted in countries in SSA (Appendix 1) and that reported in either English or French

**Types of sources**

The sources of information for this review were reports and published literature.

## Search strategy

The search strategy aimed at identifying published literature from the selected databases. There was no limitation on the year of publication. The literature search was conducted in three stages (The Joanna Briggs Institute, 2015). In the first stage, PUBMED was searched with the initial keywords. The identified literature was reviewed by abstract and additional keywords were identified. In the second stage, the additional keywords identified at stage one were added and further used to search PUBMED and Google Scholar. The references of selected studies, as well as “Similar Articles” to identified studies in PubMed were searched for any other relevant studies in the third stage. Online searches of the International Society of Blood Transfusion (ISBT) journals and newsletter, Vox Sanguinis, Transfusion Today and ISBT Science Series were further performed for additional relevant reports and conference abstracts. The database searches were conducted by one author and repeated by a second author. The online searches of journals and newsletter were conducted by one author and three assistants.

Initial keywords were “blood, blood donation, blood donor, perceptions, motivators, deterrents, attitudinal factors, Africa, sub-Saharan Africa, Africa south of Sahara”. The keywords were placed in the following format for the initial searches - [[ blood OR blood donor OR blood donation] AND [perceptions OR motivators OR deterrents OR attitudinal factors] AND [sub-Saharan Africa OR Africa OR Africa south of Sahara]]. Additional keywords identified were “barriers, misperceptions, attitudes, beliefs, obstacles”.

## Study Selection, Extraction of Data and Analysis

The selection of studies for the review followed the PRISMA Flow Diagram (Figure 1). To describe the studies included in the review, a matrix was designed to capture the population, contextual and conceptual categories such as year, country, aim, type of study, study population, sample size, sampling methods and themes relevant to the objective of the review. The key findings were extracted using a data extraction sheet which was designed based on “the framework method for analysis of qualitative data” (Gale et al., 2013) and pilot tested on the first three identified papers. This was reviewed by all four authors. The key findings were reorganized and reported in accordance with the major themes addressing the objectives of the review.

Results

## Overview of studies included in the review

We included 35 studies from SSA in the review (Table 1). These were 27 peer-reviewed studies, seven peer-reviewed conference abstracts (Adegoke, 2016; Adewuyi, and Olawumi, 2006; Asamoah-Akuoko et al., 2016; Chandrasekar et al., 2015; Los et al., 2009; von Bukenya, 2012; von Zahran and von Ali, 2013), and one peer reviewed, published report (Harrington, 2012). Nigeria (**12** studies) had the highest number of published studies, followed by Ghana and Uganda (three each), Cameroon, Democratic Republic of Congo, South Africa and Togo (two each) and one each from the remaining countries. Sixty percent (27) of the included studies were published between 2010 and 2016. Most studies focused on knowledge attitude and practice of blood donation. Blood donor perceptions, motivators and deterrents were the focus of 22, 24 and 28 studies respectively.

## Perceptions (Table 2)

A common perception of blood, identified in the majority of the studies on this topic, was the perception that blood is essential for the sustenance of life, expressed as, for example, “blood is life”, “blood is the source of life”, “blood is the fuel of life” (Agbovi et al., 2006; Asamoah-Akuoko et al., 2016; Kabinda et al., 2014; Rolseth et al., 2014). This perception of blood is cited by 88.7% and 97.2 % of respondents in Kabinda et al (2014) and Asamoah-Akuoko et al (2016) respectively. Blood donation was also commonly perceived as a good and lifesaving act (Agbovi et al., 2006; Haoses-Gorases and Katjire, 2013; Harrington, 2012; Jacobs and Berege, 1995; Koster and Hassall, 2011; Melku et al., 2016; Salaudeen et al., 2011; Salaudeen and Odeh, 2011; Sekoni et al., 2014). Blood was also considered a determinant of physical strength and health (Gobatto, 1996) and therefore donating blood was considered to have the potential to make a person weak (Harrington, 2012), unhealthy, ill (Gobatto, 1996; Jacobs and Berege, 1995; Mwaba and Keikelame, 1995; Obi, 2007; Sekoni et al., 2014; von Zahran and von Ali, 2013), or lead to death (Harrington, 2012; Salaudeen et al., 2011; Sekoni et al., 2014). To this extent, receiving “weak” blood was also believed to make the recipient weak (Gobatto, 1996).

Despite the recognition that blood donation is important, several studies found that a common perception was that one could catch a disease through donating blood. This was mentioned in eight studies, and cited by 25% to 53.5% of respondents in some studies (Harrington, 2012; Jacobs and Berege, 1995; Mwaba and Keikelame, 1995; Obi, 2007; Rolseth et al., 2014; Salaudeen et al., 2011; Sekoni et al., 2014; von Zahran and von Ali, 2013). Some perceptions identified in the review reflect spiritual (Asamoah-Akuoko et al., 2016; Gobatto, 1996; Koster and Hassall, 2011; Salaudeen et al., 2011) and religious (Agbovi et al., 2006; Asamoah-Akuoko et al., 2016; Gobatto, 1996; Harrington, 2012; Kabinda et al., 2014; Koster and Hassall, 2011) connotations of blood donation. In SSA blood is considered a substance that is common to family, kin or tribe (Koster and Hassall, 2011; Rolseth et al., 2014), private, precious (Koster and Hassall, 2011) and not be shared or taken outside the body except under the extreme circumstances of saving a life, especially that of a family member (Gobatto, 1996; Koster and Hassall, 2011). A South African study (Muthivhi et al, 2015) identified the perception that there is racial discrimination regarding the acceptability of donated blood for transfusion. This was an isolated finding among the SSA studies, although in Nigeria other beliefs such as “females cannot donate blood” or even males in some cases, and that blood donation is reserved for the military were identified by some studies (Ahmed et al., 2006; Obi, 2007; Olaiya et al., 2004; Salaudeen et al., 2011; Sekoni et al., 2014).

## Motivators (Table 3)

Altruism, cited as for example, “to save lives”, or “to help a person in need”, was identified as a major motivator for blood donation in SSA. It was mentioned in 20 studies and cited by 43% to 92% of participants in some studies (Adewuyi, and Olawumi, 2006; Asamoah-Akuoko et al., 2016; Asenso-Mensah et al., 2014, 2013; Chandrasekar et al., 2015; Duboz et al., 2010; Haoses-Gorases and Katjire, 2013; Jacobs and Berege, 1995; Kabinda et al., 2014; Koster and Hassall, 2011; Muthivhi et al., 2015; Natukunda et al., 2015; Nébié et al., 2007; Okpara, 1989; Olaiya et al., 2004; Salaudeen et al., 2011; Salaudeen and Odeh, 2011; Sekoni et al., 2014). Altruism was an important motivator for FRD who were willing to donate again (Rolseth et al, 2014) and even among groups where some form of compensation was expected for donating blood (Koster and Hassall, 2011; Salaudeen et al., 2011). Reciprocity and an identified need for blood by a family or friend was a strong motivator cited by 77.8% to 95.3% of participants in some studies (Adegoke, 2016; Adewuyi, and Olawumi, 2006; Asamoah-Akuoko et al., 2016; Duboz et al., 2010; Gobatto, 1996; Jacobs and Berege, 1995; Kabinda et al., 2014; Muthivhi et al., 2015; Nébié et al., 2007; Rolseth et al., 2014; Salaudeen et al., 2011; Salaudeen and Odeh, 2011).

In addition to altruism, in a study in Bamenda, Cameroon Koster and Hassall (2011) identified monetary and non-monetary compensation as key motivators for blood donation. In this study, some participants expected compensation for donating blood, citing the perceived risks, effort and time expended. Compensation was expected for donations to non-family members and to family members, while still regarding the donation to be “voluntary”. However, Rolseth et al’s study in Cameroon (2014) found that compensation for blood donation, although offered, was not expected by 87% of participants.

Monetary compensation as a motivator, cited by 50% of participants in a study by Umeora et al (2005), was supported by other studies from Nigeria (Adewuyi, and Olawumi, 2006; Durosinmi et al., 2003; Olaiya et al., 2004; Salaudeen and Odeh, 2011; Sekoni et al., 2014), Democratic Republic of Congo (Agasa and Likwela, 2014; Kabinda et al., 2014) and Ghana (Asamoah-Akuoko et al., 2016). Although cited as a motivator, it was not significant in South Africa (Muthivhi et al., 2015). Non-cash incentives reported included health benefits such as health checks (Gobatto, 1996; von Bukenya, 2012), infectious diseases screening and blood group results (Adewuyi, and Olawumi, 2006; Duboz et al., 2010; Gobatto, 1996; Haoses-Gorases and Katjire, 2013; Nébié et al., 2007; von Bukenya, 2012); awards, recognition; certificate and blood crediting (Chandrasekar et al., 2015; Gobatto, 1996; Jacobs and Berege, 1995; Olaiya et al., 2004); gift items (Gobatto, 1996; Muthivhi et al., 2015; Salaudeen and Odeh, 2011) and transport reimbursement (Chandrasekar et al., 2015).

Other key motivators were: promotional communication such as advertising, direct marketing, educational approaches and blood drives; awareness campaigns, access to information and knowledge of the need for blood and benefits of blood donation; and social norms and perceived need for blood (Table 3).

## Deterrents (Table 4)

The review identified fear as the single most reported deterrent, mentioned in 25 studies and cited by 35% to 86.7% in these studies. Fears related to pain from the blood donation process (Koster and Hassall, 2011), adverse effects (Muthivhi et al., 2015; Mwaba and Keikelame, 1995; Olaiya et al., 2004; Rolseth et al., 2014; Salaudeen and Odeh, 2011; Umeora et al., 2005), the sight of blood (Muthivhi et al., 2015) and, contagion (Agasa and Likwela, 2014; Agbovi et al., 2006; Gobatto, 1996; Haoses-Gorases and Katjire, 2013; Jacobs and Berege, 1995; Muthivhi et al., 2015; Olaiya et al., 2004; Salaudeen and Odeh, 2011; Sekoni et al., 2014; Umeora et al., 2005) or perceived side effects of donation, such as fear of falling sick (Agasa and Likwela, 2014; Agbovi et al., 2006; Alinon et al., 2014; Jacobs and Berege, 1995; Kabinda et al., 2014; Melku et al., 2016; Muthivhi et al., 2015; Natukunda et al., 2015; Rolseth et al., 2014; Sekoni et al., 2014; Umeora et al., 2005); and fear of the spirituality of blood (Alinon et al., 2014; Gobatto, 1996; Umeora et al., 2005). Other deterrents cited were lack of knowledge, information and awareness of need; as well as low self-efficacy (lack control over events that affect a person’s life and own functioning), inconvenience of time and donation site, and religiousity (religious affiliation or spiritual commitment).

In South Africa, Muthivhi et al (2015) identified, cynicism or scepticism due to the belief that blood donated by black people will be discarded as a key deterrent. Other issues of trust (Chandrasekar et al., 2015; von Zahran and von Ali, 2013) including a belief that donated blood would be sold (Agasa and Likwela, 2014; Agbovi et al., 2006; Alinon et al., 2014; Kabinda et al., 2014) and socio-economic difficulties (Agasa and Likwela, 2014; Ahmed et al., 2006; Duboz et al., 2010; Gobatto, 1996), with perceived lack of capacity to recover from possible or perceived effects of blood donation, or not having been asked to donate (Agasa and Likwela, 2014; Durosinmi et al., 2003; Rolseth et al., 2014; Sekoni et al., 2014) were also deterrents. Although incentives were cited as strong motivators for blood donation, lack of incentives as a deterrent was cited by only three studies (Alinon et al., 2014; Kabinda et al., 2014; Umeora et al., 2005). Previous deferral as a donor was not cited as a deterrent in any study.

Discussion

Many studies have evaluated the motivators and deterrents of blood donation globally, but currently little is known about what factors influence blood donation in SSA. This scoping review identified and analysed 35 studies on perceptions, and enabling and deterring factors that impact blood donation in SSA. The perceptions of blood and blood donation identified in the review are reflected in the statement: “Blood was once regarded as the fluid of infinite complexity, the very essence of life; the blood of each person seemed to carry in it the secret of individuality” (Mollison et al., 1993), because although blood is scientifically defined as a specialized connective tissue that performs vital functions in the body, the perceptions identified encompass the spiritual as well as the physical. The main themes that emerged are altruism and fear; influence of cultural environment and perceptions; and voluntary blood donation, socio-economic difficulties and compensation. Some themes are common to other parts of the world, but this study has shown that SSA has its own unique factors that should be considered when designing interventions for improving blood donation.

## Altruism and fear

Similar to blood donors in the rest of the world, blood donors in SSA countries would like to contribute to society by saving lives. Altruism was a common motivator irrespective of donation status and type of donor (Rolseth et al., 2014; Salaudeen et al., 2011) but this needs exploring further in SSA because, despite the commonly reported altruistic intentions, voluntary blood donation rates are still far below what is required.

The review identified fear as a major deterrent. While fears such as of the needle, pain, adverse effects of donation, sight of blood and contagion may be common among people of other regions, other aspects of fear such as fear of blood being used for rituals, and the fear that able-bodied men who donate blood may become impotent, are important to people of SSA. This suggests a need for targeted interventions that address these specific issues. As an example, to address the fear of men becoming impotent after blood donation, older blood donors with children could be used as agents of change. The review found that lack of information was a deterrent since it led to misconceptions and fear associated with blood donation experience. Donor recruitment agencies in SSA therefore need to have a much more in-depth understanding of what information is required by donors so they can improve their interventions to address these fears and misconceptions.

## Influence of cultural environment and perceptions

Linked to altruism and fear is the impact of culture on blood donation. In SSA, people believe that blood is sacred and thus should be preserved, and that blood is common to kin (Asamoah-Akuoko et al., 2016). Perhaps, this explains why many people prefer to donate blood for a family member rather than to give to someone unknown to them. In SSA where the concepts of kinship and communalism are so deeply rooted, donating blood for families is clearly a strong incentive, which is not reflected in current policies that seek to eliminate the FRD system (WHO, 2010). However, hidden “paid” donors may occasionally abuse the FRD system, therefore the issue of encouraging FRDs remains contentious.

The influence of culture is reflected in spiritual and religious connotations ascribed to blood and blood donation, and impacts on blood donation. For example, individuals who view blood as gift from God and a source of salvation may be more willing to donate than those who view blood as being able to transfer character or witchcraft to a recipient, as important for rituals, or being prohibited by religion.

## Voluntary blood donation, socio-economic difficulties and compensation

In Ghana, over 72% of FRD state that they are voluntary donors because, although they donated for family, they were not compelled to donate and had the option of not donating (Asamoah-Akuoko et al., 2016). Rolseth et al’s study (2014) identified that compensation for blood donation which could be expected even for persons donating for family, was considered consistent with voluntary blood donation. The concept of ’voluntary blood donation’, and campaigns that focus on this concept, may therefore not resonate with populations in SSA and will have to be re-framed around new, yet to be determined, concepts (Koster and Hassall, 2011).

To effectively discuss socio-economic difficulties and compensation in relation to blood donation, it is important to clearly define what constitutes an incentive, compensation and payment. This is difficult since it is related to the context and factors associated with the individual socio-economic conditions of each potential blood donor. This review identified different views on what constitutes compensation or incentives for blood donation in SSA. Non-cash incentives such as using blood donation as a health check (Gobatto, 1996; von Bukenya, 2012) including knowing one’s blood group (Duboz et al., 2010; Gobatto, 1996; Haoses-Gorases and Katjire, 2013; von Bukenya, 2012) have implications for blood donor recruitment and retention efforts. A worrying observation in SSA is the expectation of cash incentives, which could make it difficult to sustain blood services and risks commercializing blood donation. Thus, it is worthy to explore more non-cash incentives such as awards and recognition (Chandrasekar et al., 2015; Olaiya et al., 2004) for dedicated blood donors. In addition, better education, targeted at de-bunking some of the myths may make people become less demanding of incentives.

## Strengths and Limitations

This scoping review employed a standard approach and rigorous, transparent methods which was developed and reviewed by all authors. The review only included published literature and did not appraise the quality of individual studies.

# Conclusion

This scoping review identifies a number of important factors that influence blood donation in SSA. A common factor that was identified was the belief that blood is lifesaving and consequently that blood donation saves lives. Not surprisingly, altruism was a prevalent motivator. Monetary and non-monetary incentives were also strong motivators for blood donation. Fear, due to lack of knowledge and information, and the discouraging religious, spiritual and cultural connotations associated with blood and blood donation were common deterrents to donating blood. The interplay between the motivating and deterring factors identified in this review demonstrates that potential donors in SSA who regard themselves as “altruistic” may donate only to save a family or friend, or may donate in expectation of an incentive or a compensation. They would therefore not be regarded as “voluntary non-remunerated donors” according to the WHO definition (WHO, 2010).

Moving forward, there is a need for the use of robust qualitative and quantitative methodologies to undertake in-depth exploration of motivators and deterrents relevant for blood donors in SSA, to address the gaps in available evidence. This will help to prioritize interventions that are targeted and culturally appropriate in the SSA context. In this regard, culturally sensitive efforts should explore ways to enhance altruism by linking blood transfusion to the benefit of families. This strategy should include efforts to motivate FRD to continue donating as VNRD. Educational and awareness information should describe the medical use of blood and directly tackle various misconceptions such as the use of blood for rituals, and blood donation causing weakness and impotence. Researchers will need to work closely with blood donor recruitment agencies, National Blood Services and their collaborators to provide scholarly support to improve policy and practice.

It is important to note that while some factors, such as the need for information and sensitization may be common to many countries, a number of factors such as payment for donations were only identified in a few countries. SSA countries will therefore benefit from a country-by-country approach aimed at addressing the specific needs of countries, measures that have already been put in place and available resources.

Conflicts of Interest

The authours declare no conflict of interest

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# Authorship Contribution

Conception or design of the work: HU, IB. LAA, OWH

Data collection: LAA

Data analysis and interpretation: LAA, HU

Drafting the article: LAA

Critical revision of the article: HU, IB, OWH

Final approval of the version to be published: HU, IB, OWH, LAA

References

Adegoke, O., 2016. Attitude to Blood Donation Among a Tertiary Hospital Workers in Nigeria. Vox Sang. 111, 120–121. doi:10.1111/vox.12429

Adewuyi, J.O., Olawumi, H.O., 2006. Factors in the Low Recruitment of Voluntary Blood Donors Among Eligible Nigerians. Vox Sang. 91, 194. doi:10.1111/j.0042-9007.2006.vox\_v91\_is3\_posters.x

Agasa, S.B., Likwela, J.L., 2014. [Barriers to voluntary blood donation in the population of Kisangani in the Democratic Republic of Congo]. Pan Afr. Med. J. 17, 306. doi:10.11604/pamj.2014.17.306.2663

Agbovi, K.-K., Kolou, M., Fétéké, L., Haudrechy, D., North, M.-L., Ségbéna, A.-Y., 2006. [Knowledge, attitudes and practices about blood donation. A sociological study among the population of Lomé in Togo]. Transfus. Clin. Biol. J. Société Fr. Transfus. Sang. 13, 260–265. doi:10.1016/j.tracli.2006.06.002

Ahmed, S.G., Gamas, M.G., Kagu, M.B., 2006. Declining frequency of blood donation among elites in Maiduguri, Nigeria. Afr. J. Med. Med. Sci. 35, 359–363.

Ajzen, I., 1991. THE THEORY OF PLANNED BEHAVIOR.pdf. Organ. Behav. Hum. Decis. Process 50, 179–211.

Alinon, K., Gbati, K., Sorum, P.C., Mullet, E., 2014. Emotional-motivational barriers to blood donation among Togolese adults: a structural approach. Transfus. Med. Oxf. Engl. 24, 21–26. doi:10.1111/tme.12082

Allain, J.-P., Sarkodie, F., Asenso-Mensah, K., Owusu-Ofori, S., 2010. Relative safety of first-time volunteer and replacement donors in West Africa. Transfusion (Paris) 50, 340–343. doi:10.1111/j.1537-2995.2009.02444.x

Allain, J.-P., Sarkodie, F., Boateng, P., Asenso, K., Kyeremateng, E., Owusu-Ofori, S., 2008. A pool of repeat blood donors can be generated with little expense to the blood center in sub-Saharan Africa. Transfusion (Paris) 48, 735–741. doi:10.1111/j.1537-2995.2007.01599.x

Arksey, H., O’Malley, L., 2005. Scoping studies: towards a methodological framework. Int. J. Soc. Res. Methodol. 8, 19–32. doi:10.1080/1364557032000119616

Asamoah-Akuoko, L., Hassall, O.W., Bates, I., Adongo, P.B., Bygbjerg, I.C., Ullum, H., 2016. Socio-Demographic Characteristics and Attitudinal Factors in First-Time Voluntary and Family Replacement Blood Donors in Southern Ghana. Vox Sang. 111, 120. doi:10.1111/vox.12429

Asenso-Mensah, K., Achina, G., Appiah, R., Owusu-Ofori, S., Allain, J.-P., 2014. Can family or replacement blood donors become regular volunteer donors? Transfusion (Paris) 54, 797–804. doi:10.1111/trf.12216

Asenso-Mensah, K., Achina, G., Appiah, R., Owusu-Ofori, S., Allain, J.-P., 2013. Can family or replacement blood donors become regular volunteer donors? Transfusion (Paris). doi:10.1111/trf.12216

Basavaraju, S.V., Mwangi, J., Kellogg, T.A., Odawo, L., Marum, L.H., 2007 Kenya AIDS Indicator Survey Group, 2010. Quantification of print, radio and television exposure among previous blood donors in Kenya: an opportunity for encouraging repeat donation in a resource-limited setting? Vox Sang. 99, 274–277. doi:10.1111/j.1423-0410.2010.01369.x

Bates, I., Chapotera, G.K., McKew, S., van den Broek, N., 2008. Maternal mortality in sub-Saharan Africa: the contribution of ineffective blood transfusion services. BJOG Int. J. Obstet. Gynaecol. 115, 1331–1339. doi:10.1111/j.1471-0528.2008.01866.x

Bednall, T.C., Bove, L.L., 2011. Donating Blood: A Meta-Analytic Review of Self-Reported Motivators and Deterrents. Transfus. Med. Rev. 25, 317–334. doi:10.1016/j.tmrv.2011.04.005

Chandrasekar, B.C., Latham, T.L., Dessoffy, T.R.D., Njolomole, S.N., Olatunji, O., 2015. Retaining School Leavers as Repeat Blood Donors in Malawi. Vox Sang. 109, 133. doi:10.1111/vox.12304

Clark, K.A., Kataaha, P., Mwangi, J., Nyamongo, J., 2005. Predonation testing of potential blood donors in resource-restricted settings. Transfusion (Paris) 45, 130–132. doi:10.1111/j.1537-2995.2004.04398.x

Custer, B., Johnson, E.S., Sullivan, S.D., Hazlet, T.K., Ramsey, S.D., Murphy, E.L., Busch, M.P., 2005. Community blood supply model: development of a new model to assess the safety, sufficiency, and cost of the blood supply. Med. Decis. Mak. Int. J. Soc. Med. Decis. Mak. 25, 571–582. doi:10.1177/0272989X05280557

Dahourou, H., Tapko, J.-B., Kienou, K., Nebie, K., Sanou, M., 2010. Recruitment of blood donors in Burkina Faso: how to avoid donations from family members? Biologicals, Special Section: Advances in Transfusion Safety (pp. 1-104) 38, 39–42. doi:10.1016/j.biologicals.2009.10.017

Duboz, P., Macia, E., Cunéo, B., 2010. Sociodemographic and attitudinal factors to blood donation in the urban population of Dakar, Senegal. Transfusion (Paris) 50, 2713–2720. doi:10.1111/j.1537-2995.2010.02750.x

Durosinmi, M.A., Mabayoje, V.O., Akinola, N.O., Adegunloye, A.B., Alabi, A.O., 2003. A retrospective study of prevalence of antibody to HIV in blood donors at Ile-Ife, Nigeria. Niger. Postgrad. Med. J. 10, 220–223.

Ferguson, E., France, C.R., Abraham, C., Ditto, B., Sheeran, P., 2007. Improving blood donor recruitment and retention: integrating theoretical advances from social and behavioral science research agendas. Transfusion (Paris) 47, 1999–2010. doi:10.1111/j.1537-2995.2007.01423.x

France, C.R., France, J.L., Wissel, M.E., Ditto, B., Dickert, T., Himawan, L.K., 2013. Donor anxiety, needle pain, and syncopal reactions combine to determine retention: a path analysis of two-year donor return data. Transfusion (Paris) n/a–n/a. doi:10.1111/trf.12069

Gale, N.K., Heath, G., Cameron, E., Rashid, S., Redwood, S., 2013. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. BMC Med. Res. Methodol. 13, 117. doi:10.1186/1471-2288-13-117

Gobatto, I., 1996. Donating blood in the time of AIDS. Some ideas from a study in Bangui (Central African Republic). Current research. Sociétés Afr. SIDA Newsl. Sociétés Afr. SIDA Netw. 8–10.

Godin, G., Vézina-Im, L.-A., Bélanger-Gravel, A., Amireault, S., 2012. Efficacy of Interventions Promoting Blood Donation: A Systematic Review. Transfus. Med. Rev. 26, 224–237.e6. doi:10.1016/j.tmrv.2011.10.001

Haoses-Gorases, L., Katjire, M., 2013. Assessment of Knowledge, Beliefs, Perceptions Attitudes and Practices on Voluntary Non-remunerated Blood Donations in Namibia. Online J Med Med Sci Res. Online J. Med. Med. Sci. Res. 2, 63–71.

Harrington, A. H. (2012) Blood Banks in Kumasi, Ghana: Social Barriers Preventing Volunteer Blood Donations. University of Michigan Undergraduate Research Journal, 9, 4-7. https://deepblue.lib.umich.edu/bitstream/handle/2027.42/97003/UMURJIssue09\_2012AHHarrington.pdf?sequence=1. Accessed 21 September 201.

Jacobs, B., Berege, Z.A., 1995. Attitudes and beliefs about blood donation among adults in Mwanza Region, Tanzania. East Afr. Med. J. 72, 345–348.

Kabinda, J.M., Miyanga, S.A., Ramazani, S.Y., Dramaix, M.-W., 2014. Assessment of Knowledge, Attitude and Practice of the General Population of Bukavu in the Democratic Republic of Congo on Blood Donation and Blood Transfusion. Health (N. Y.) 6, 2525–2534. doi:10.4236/health.2014.618291

Khan, K.S., Wojdyla, D., Say, L., Gülmezoglu, A.M., Van Look, P.F.A., 2006. WHO analysis of causes of maternal death: a systematic review. Lancet 367, 1066–1074. doi:10.1016/S0140-6736(06)68397-9

Koster, J., Hassall, O.W., 2011. Attitudes towards blood donation and transfusion in Bamenda, Republic of Cameroon. Transfus. Med. 21, 301–307. doi:10.1111/j.1365-3148.2011.01079.x

Lagarde, E., 2007. Road Traffic Injury Is an Escalating Burden in Africa and Deserves Proportionate Research Efforts. PLOS Med 4, 170. doi:10.1371/journal.pmed.0040170

Los, T., Gabra, G., Mutegombwa2, S., Sibinga, C.S., 2009. The Role of School Teachers to Support Blood Collection and Donor Retention at Schools. Vox Sang. 96, 28. doi:10.1111/j.1423-0410.2009.01155.x

Marsh, K., Forster, D., Waruiru, C., Isiah Mwangi, 1995. Indicators of Life-Threatening Malaria in African Children. NEJM 332, 1399–1404.

Masser, B.M., White, K.M., Hyde, M.K., Terry, D.J., 2008. The Psychology of Blood Donation: Current Research and Future Directions. Transfus. Med. Rev. 22, 215–233. doi:10.1016/j.tmrv.2008.02.005

Melku, M., Terefe, B., Asrie, F., Enawgaw, B., Melak, T., Tsegay, Y.G., Areba, M., Shiferaw, E., 2016. Knowledge, Attitude, and Practice of Adult Population towards Blood Donation in Gondar Town, Northwest Ethiopia: A Community Based Cross-Sectional Study. J. Blood Transfus. 2016, e7949862. doi:10.1155/2016/7949862

Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., PRISMA Group, 2009. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. Ann. Intern. Med. 151, 264–269, W64.

Mollison, P.L., Engelfriet, C.P., Contreras, M., 1993. Blood Transfusion in Clinical Medicine, Ninth. ed. Blackwell Scientific Publications.

Muthivhi, T.N., Olmsted, M.G., Park, H., Sha, M., Raju, V., Mokoena, T., Bloch, E.M., Murphy, E.L., Reddy, R., 2015. Motivators and deterrents to blood donation among Black South Africans: a qualitative analysis of focus group data. Transfus. Med. Oxf. Engl. 25, 249–258. doi:10.1111/tme.12218

Mwaba, K., Keikelame, M.J., 1995. Blood donation behaviour and beliefs among a sample of high school students in Mmabatho. Curationis 18, 2–3.

Natukunda, P.B., Agaba, E., Wabuyi, P., Bortolussi, R., McBride, E., 2015. Knowledge, Attitudes, and Practices about Regular, Voluntary Non-remunerated Blood Donation in Peri-urban and Rural Communities in Mbarara District, South Western Uganda, and its Impact on Maternal Health. J. Obstet. Gynaecol. Can. JOGC J. Obstétrique Gynécologie Can. JOGC 37, 903–904.

Nébié, K.Y., Olinger, C.M., Kafando, E., Dahourou, H., Diallo, S., Kientega, Y., Domo, Y., Kienou, K., Ouattara, S., Sawadogo, I., Ky, L., Muller, C.P., 2007. [Lack of knowledge among blood donors in Burkina Faso (West Africa); potential obstacle to transfusion security]. Transfus. Clin. Biol. J. Société Fr. Transfus. Sang. 14, 446–452. doi:10.1016/j.tracli.2007.12.005

Obi, S.N., 2007. Antenatal blood donation for pregnant Nigerian mothers: the husbands’ perspective. J. Obstet. Gynaecol. J. Inst. Obstet. Gynaecol. 27, 467–469. doi:10.1080/01443610701405986

Okpara, R.A., 1989. Attitudes of Nigerians towards blood donation and blood transfusion. Trop. Geogr. Med. 41, 89–93.

Olaiya, M.A., Alakija, W., Ajala, A., Olatunji, R.O., 2004. Knowledge, attitudes, beliefs and motivations towards blood donations among blood donors in Lagos, Nigeria. Transfus. Med. 14, 13–17. doi:10.1111/j.0958-7578.2004.00474.x

Ottong, J.G., Asuquo, E.E., Olaniran, N.S., Duke, F.D., Abia, R.P., 1997. Community mobilization for blood donation, Cross River State, Nigeria. The Calabar PMM Team. Int. J. Gynaecol. Obstet. Off. Organ Int. Fed. Gynaecol. Obstet. 59 Suppl 2, S119-125.

Owusu-Ofori, S., Asenso-Mensah, K., Boateng, P., Sarkodie, F., Allain, J.-P., 2010. Fostering repeat donations in Ghana. Biol. J. Int. Assoc. Biol. Stand. 38, 47–52. doi:10.1016/j.biologicals.2009.10.021

Pule, P.I., Rachaba, B., Magafu, M.G.M.D., Habte, D., 2014. Factors Associated with Intention to Donate Blood: Sociodemographic and Past Experience Variables. J. Blood Transfus. 2014, e571678. doi:10.1155/2014/571678

Reddy, R., 2012. Blood donation patterns and challenges in Southern Africa. ISBT Sci. Ser. 7, 296–299. doi:10.1111/j.1751-2824.2012.01576.x

Rolseth, S., Stange, P., Adamou, D., Roald, B., Danki-Sillong, F., Jourdan, P., 2014. The acceptability of volunteer, repeat blood donations in a hospital setting in the Adamaoua region of Cameroon. Transfus. Med. Oxf. Engl. 24, 372–378. doi:10.1111/tme.12156

Salaudeen, A.G., Musa, O.I., Awoyemi, A.O., Bolarinwa, A.O., Adegboye, A.O., Samuel, S.O., 2011. Community survey on blood donation practices in a northern state of Nigeria. J. Prev. Med. Hyg. 52, 21–25.

Salaudeen, A.G., Odeh, E., 2011. Knowledge and behavior towards voluntary blood donation among students of a tertiary institution in Nigeria. Niger. J. Clin. Pract. 14, 303–307. doi:10.4103/1119-3077.86773

Sarkodie, F., Hassall, O., Owusu-Dabo, E., Owusu-Ofori, S., Bates, I., Bygbjerg, I.C., Owusu-Ofori, A., Harritshøj, L.H., Ullum, H., 2016. Improving the screening of blood donors with syphilis rapid diagnostic test (RDT) and rapid plasma reagin (RPR) in low- and middle-income countries (LMIC). Transfus. Med. n/a-n/a. doi:10.1111/tme.12363

Sekoni, A.O., Balogun, M.R., Odukoya, O.O., Inem, V., Onigbogi, O.O., 2014. Blood donation practices and willingness to donate among residents of an urban slum in Lagos Nigeria. Niger. Postgrad. Med. J. 21, 21–27.

Tapko, J., Mainuka, P., Diarra-Nama, A., 2009. STATUS OF BLOOD SAFETY IN THE WHO AFRICAN REGION - REPORT OF THE 2006 SURVEY. WHO AFRO.

Tapko, J., Toure, B., Sambo, L., 2014. Status of Blood Safety in the WHO African Region - Report of the 2010 Survey. WHO | Regional Office for Africa, Brazaville.

The Joanna Briggs Institute, 2015. Joanna Briggs Institute Reviewers’ Manual: 2015 edition / Methodology for JBI Scoping Reviews.

Umeora, O.U.J., Onuh, S.O., Umeora, M.C., 2005. Socio-cultural barriers to voluntary blood donation for obstetric use in a rural Nigerian village. Afr. J. Reprod. Health 9, 72–76.

von Bukenya, P.H., 2012. Donor Recruitment in Communities with Inadequate Health Care Systems. Vox Sang. 103, 91–92. doi:10.1111/j.1423-0410.2012.01615\_1.x

von Zahran, M., von Ali, M., 2013. Assessment of Motivating and Demotivating Factors of Voluntary Blood Donation Among the Students of Khartoum State Universities (November, 2009 – May, 2010). Vox Sang. 105, 101. doi:10.1111/vox.12048

WHO, 2016. WHO | Blood safety and availability [WWW Document]. WHO. URL http://www.who.int/mediacentre/factsheets/fs279/en/ (accessed 10.7.16).

WHO, 2015. WHO | Trends in maternal mortality: 1990 to 2015 Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division (WHO reference number WHO/RHR/15.23). World Health Organization, Geneva.

WHO, 2012. Blood safety and availability (Fact Sheet No. 279). [WWW Document]. World Health Organization. URL http://www.who.int/mediacentre/factsheet s/fs279/en/

WHO, 2010. WHO | Towards 100% voluntary blood donation: a global framework for action. World Health Organization, Geneva. Available at: (No. ISBN 978 92 4 159969 6). http://www.who.int/bloodsafety/publication s/9789241599696/en/

WHO, 2008. Global Database on Blood Safety: Report 2004-2005. World Health Organization, Geneva. Available at: http://www.who.int/bloodsafety/global\_dat abase/en/

WHO, 2001. Blood safety: a strategy for the African region. World Health Organization Organisation Regional Office For Africa. WWW document, URL: http://apps.who.int/iris/bitstream/10665/1888/1/AFR.RC51.9%20Rev.1.pdf

WHO/BTS, 2009. WHO | Aide-mémoire: Blood safety [WWW Document]. WHO. URL http://www.who.int/bloodsafety/publications/who\_bct\_02\_03/en/index.html (accessed 8.16.12).

# APPENDIX I

## Countries of Sub-Saharan African

(Angola or Benin or Botswana or Burkina Faso or Burundi or Cameroon or Cape Verde or Central African Republic or Chad or Comoros or Congo or Cote d’Ivoire or Djibouti or Equatorial Guinea or Eritrea or Ethiopia or Gabon or Gambia or Ghana or Guinea or Guinea-Bissau or Kenya or Lesotho or Liberia or Madagascar or Malawi or Mali or Mauritania or Mauritius or Mozambique or Namibia or Niger or Nigeria or Rwanda or Sao Tome or Senegal or Seychelles or Sierra Leone or Somalia or South Africa or South Sudan or Sudan or Swaziland or Tanzania or Togo or Uganda or Zambia or Zimbabwe)

Records identified through database searching
(n = 103 )

## Screening

## Included

## Eligibility

## Identification

Additional records identified through other sources
(n = 24 )

Records after duplicates removed
(n = 63 )

Records screened by abstract
(n = 63 )

Records excluded
(n = 13 )

Studies included in scoping review
(n = 35 )

Full-text articles assessed for eligibility by full text or abstract
(n = 50 )

Full-text articles and abstracts excluded with reasons
(n = 5 )

Not relevant = 13

Reviews = 2

Figure 1. PRISMA Flow Diagram for the scoping review process (Moher et al., 2009)

**Table 1. Overview of the studies included in the review**

| **No.** | **Study** | **Country** | **Type of study** | **Study population** | **Sample size** |  **Method** | **Relevant Themes** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Pule et al., 2014 | Botswana | Quantitative | Blood donors | 384 | CSS  | D  |
| 2 | Nébié et al 2007\*\* | Burkina Faso | Quantitative | Blood donors | 544 | CSS  | M  |
| 3 | Koster and Hassall 2011 | Cameroon | Qualitative | Community members | Not specified | KII, FGD | P M  |
| 4 | Rolseth et al 2014 | Cameroon | Qualitative | community members  | 49 | KII  | P M D  |
| 5 | Gobatto 1996  | Central African Republic | Qualitative | Donors, non-donors | Not specified | KII | P M D |
| 6 | Agasa and Likwela 2014\*\* | D R Congo | Quantitative | Community, adults  | 1067 |  CSS | D  |
| 7 | Kabinda 2014 | D R Congo | Quantitative | Community, adults | 416 | CSS | P M D  |
| 8 | Melku et al 2016 | Ethiopia | Quantitative | adult population | 768 | CSS | P D  |
| 9 | Asenso-Mensah et al 2014 | Ghana | Quantitative | FRD | 513 | CSS | M  |
| 10 | Haoses-Gorases and Katjire 2013 | Namibia | Mixed methods | Donors, non-donors | 434 | CSS, FGD | P M D  |
| 11 | Salaudeen et al. 2011 | Nigeria | Quantitative | Community members | 936 | CSS | P M  |
| 12 | Umeora et al 2005 | Nigeria | Quantitative | Non donors | 143 | CSS | D |
| 13 | Sekoni et al 2014 | Nigeria | Mixed methods | adults in community | 400 for CSS3 FGDs of 27 | CSS and FGDs | P M D  |
| 14 | Salaudeen and Odeh 2011 | Nigeria | Quantitative | students  | 400 | CSS | P M D  |
| 15 | Obi 2007 | Nigeria | Quantitative | spouses of pregnant women | 700 | CSS | P M D  |
| 16 | Durosinmi et al 2003 | Nigeria | Quantitative | blood donors | Not specified | CSS | M |
| 17 | Olaiya et al 2004 | Nigeria | Quantitative | Blood donors | 542 | CSS | M D  |
| 18 | Ottong et al., 1990 | Nigeria | Case study | Spouses, patients, hospital staff | Not specified | FGDs, KII | P D  |
| 19 | Okpara 1989 | Nigeria | Quantitative | Not specified | 246 | CSS | P M D  |
| 20 | Ahmed et al, 2006 | Nigeria | Quantitative | Blood donors | 100 | CSS | P D  |
| 21 | Duboz et al. 2010\*\*  | Senegal | Quantitative | Adults | 600 | CSS | M D  |
| 22 | Muthivhi et al. 2015 | South Africa | Qualitative | Black South Africans  | 97 | FGD | M D  |
| 23 | Mwaba et al 1995 | South Africa | Quantitative | students  | 40 | CSS | P D  |
| 24 | Jacobs et al 1995 | Tanzania | Quantitative | adult residents  | 1141 | CSS | P M D  |
| 25 | Alinon et al. 2014 | Togo | Quantitative | 400 adults | 400 | CSS | D  |
| 26 | Agbovi et al 2006\*\* | Togo | Quantitative | General population | 300 | CSS | P D  |
| 27 | Natukunda et al 2015 | Uganda | Mixed methods | Community, adults  | QS 250, FGDs 72, KIS 23 | CSS, FGD, KII | P M D |
| 28 | Asamoah-Akuoko et al 2016**)** | Ghana | Quantitative | First time donors  | 505 | CSS | P M D  |
| 29 | Chandrasekar et al 2015 | Malawi | Qualitative | students, BTS staff | 24 | FGD, Interviews | P M D  |
| 30 | Adegoke 2016 | Nigeria | Quantitative | hospital staff | 246 | CSS | M D  |
| 31 | Adewuyi and Olawumi 2006 | Nigeria | Quantitative | Adults, 16-25 years | 3000 | CSS | M D  |
| 32 | von Zahran and von Ali 2013 | Sudan | Quantitative | students  | 400 | CSS | P M D  |
| 33 | Los et al 2009 | Uganda | Case study | Teachers, students | 1600 | CSS, workshop | P D  |
| 34 | Von Bukenya 2012 | Uganda | Quantitative | Blood donors | 1677 | CSS | M |
| 35 | Harrington 2012 | Ghana | Quantitative | Church youth group  | 50 | CSS | P  |

***Key: P = Perception; M = Motivators; D = Deterrent; CSS = Cross Sectional Study; KII = Key Informant Interviews; FGD = Focus Group Discussion***

***\*\* Studies reported in French***

**Table 2. Perceptions of blood and blood donation**

| **Perceptions** | **Reference** |
| --- | --- |
| **Of blood** |  |
| ***Physical or Medical*** |
|  | Essential for life; fuel of the body; source of life  | Agbovi et al 2006; Kabinda et al 2014; Rolseth at al 2014; Asamoah-Akuoko et al 2016 |
|  | Determines health, physical strength; protect from illness; receiving “weak” blood makes on weak | Gobatto 1996 |
|  | Volume increases with physical work; cannot have enough to give spare | Koster and Hassall 2011;  |
|  | Physical; fluid in the body | Rolseth at al 2014; Koster and Hassall 2011; |
|  | Source of contagion; associated with accidents, menstruation or labour, laboratory exams, transfusion | Rolseth at al 2014; |
| ***Spiritual*** |
|  | Spiritual; used for rituals and occultism | Asamoah-Akuoko et al 2016 |
|  | Blood can transfer character and witchcraft to recipient | Ottong et al 1997; |
| ***Religious*** |
|  | Sacred | Agbovi et al 2006; Kabinda et al 2014; Asamoah-Akuoko et al 2016 |
|  | Source of salvation for Christians; signifies impurity for Muslims. | Agbovi et al 2006 |
|  | Gift from God; Created by God | Koster and Hassall 2011; Rolseth at al 2014 |
| ***Private or common to family and kin*** |
|  | Common to family and kin  | Koster and Hassall 2011; Rolseth at al 2014 |
|  | Private, precious, not to be taken outside the body; can only be shared in extreme circumstances, for good reasons | Koster and Hassall 2011; Gobatto 1996 |
| **Of Blood Donation** |  |
| ***Physical or Medical*** |
|  | Can transmit diseases, infection | Mwaba and Keikelame 1995; Salaudeen et al 2011; Sekoni et al 2014; Obi 2007; Jacobs et al 1995; Harrington 2012; von Zahran and von Ali 2013 |
|  | Can cause health problems; harmful | Mwaba and Keikelame 1995; Sekoni et al 2014; Obi 2007; Gobatto 1996; Jacobs et al 1995; von Zahran and von Ali 2013 |
|  | Cause weakness | Harrington 2012 |
|  | Is painful | Mwaba and Keikelame 1995 |
|  | Can shorten life due to psychological effect of knowing HIV status | Koster and Hassall 2011 |
|  | Dizziness, fainting attacks; helps know blood group, Hb genotye, HIV and other TTI status | Salaudeen et al 2011 |
|  | Can result in sudden deaths, death of donor; anaemia | Salaudeen et al 2011; Sekoni et al 2014; Harrington 2012 |
|  | Invokes fear; means something is wrong; help get rid of excess blood | Sekoni et al 2014 |
|  | Help reduce obesity; weight loss | Salaudeen et al 2011; Harrington 2012 |
|  | Saves the life of recipients | Salaudeen et al 2011; Sekoni et al 2014; Salaudeen and Odeh 2011; Harrington 2012; Haoses-Gorases and Katjire 2013 |
|  | Help a person in need, distress | Koster and Hassall 2011; Sekoni et al 2014 |
| ***Spiritual*** |
|  | Reduce ability to protect oneself spiritually | Gobatto 1996 |
|  | Gives spiritual satisfaction | Salaudeen et al 2011 |
|  | Donated blood can be used for occultism | Koster and Hassall 2011; Asamoah-Akuoko et al 2016 |
| ***Religious*** |
|  | Against religious belief | Harrington 2012 |
| ***Selective*** |
|  | Racial discrimination | Muthivhi et al 2015 |
|  | Females cannot donate blood | Salaudeen et al 2011; Sekoni et al 2014; Olaiya et al 2004; Ahmed et al 2006  |
|  | Males cannot donate blood | Sekoni et al 2014 |
|  | Is reserved for the military | Obi 2007 |
| ***Family or kin*** |
|  | Better to donate for family member than stranger or institution | Koster and Hassall 2011 |
| ***Trust Issues*** |
|  | Fear that blood may not be used for what is intended for | Gobatto 1996 |
| Blood donation is good, important | Agbovi et al 2006; Sekoni et al 2014; Koster and Hassall 2011; Jacobs et al 1995; Melku et al 2016 |
| Should be given for free | Salaudeen and Odeh 2011 |
| Sacrificial, sacrificing oneself | Gobatto 1996 |

**Table 3. Motivators for blood donation**

| **Motivator** | **References** |
| --- | --- |
| ***Convenience*** |
|  | Convenience  | Chandrasekar et al 2015 |
|  | of collection site | Asenso-Mensah et al 2014; Muthivhi et al 2015 |
| ***Prosocial Motivation*** |
|  | Altruism | Nébié et al 2007; Koster and Hassall 2011; Rolseth et al 2014; Kabinda 2014; Asenso-Mensah et al 2014; Haoses-Gorases and Katjire 2013; Salaudeen et al 2011; Sekoni et al 2014; Salaudeen and Odeh 2011; Olaiya et al 2004; Okpara 1989; Duboz et al 2010; Muthivhi et al 2015; Jacobs et al 1995; Natukunda et al 2015; Asamoah-Akuoko et al 2016; Chandrasekar et al 2015; Adewuyi and Olawumi 2006 |
|  | Passion for donating | Asenso-Mensah et al 2014 |
|  | Collectivism – help community  | Rolseth et al 2014; Gobatto 1996 ; Duboz et al 2010; Muthivhi et al 2015;  |
|  | Collectivism – donate for or help friends and family  | Nébié et al 2007; Rolseth et al 2014; Gobatto 1996 ; Kabinda 2014; Salaudeen et al 2011; Sekoni et al 2014; Salaudeen and Odeh 2011; Duboz et al 2010; Muthivhi et al 2015; Jacobs et al 1995; Asamoah-Akuoko et al 2016; Adegoke 2016; Adewuyi and Olawumi 2006 |
| ***Personal Values*** |
|  | Personal moral norms | Muthivhi et al 2015 |
|  | Religiosity | Sekoni et al 2014; Muthivhi et al 2015; von Zahran and von Ali 2013 |
| ***Reputation of collection agency*** |
|  | To help or support blood bank | Rolseth et al 2014 |
| ***Perceived need for blood donation*** |
|  | Everyday | Muthivhi et al 2015 |
|  | Emergency | Gobatto 1996; Muthivhi et al 2015; Salaudeen and Odeh 2011;  |
|  | Blood shortage | Duboz et al 2010 |
|  | Awareness of donation campaigns | Obi 2007 |
| ***Indirect Reciprocity*** |
|  | Upstream (friends and family) | Obi 2007; Muthivhi et al 2015 |
|  | Downstream  | Gobatto 1996; Muthivhi et al 2015; Asamoah-Akuoko et al 2016 |
|  | Upstream (self) | Nébié et al 2007; Muthivhi et al 2015 |
| ***Intrinsic Motivation*** |
|  | Intrinsic motivation; self-esteem | Muthivhi et al 2015 |
|  | Curiosity | Haoses-Gorases and Katjire 2013; Muthivhi et al 2015 |
| ***Promotional Communications*** |
|  | General advertising | Nébié et al 2007; Haoses-Gorases and Katjire 2013; Muthivhi et al 2015; von Zahran and von Ali 2013 |
|  | Direct marketing, invitation; being asked to donate | Asenso-Mensah et al 2014; Muthivhi et al 2015; Jacobs et al 1995 |
|  | Blood drives | Muthivhi et al 2015 |
|  | Educational approaches | Muthivhi et al 2015; Chandrasekar et al 2015 |
|  | Awareness campaigns | Duboz et al 2010 |
| ***Incentives*** |
|  | General | Asenso-Mensah et al 2014; Duboz et al 2010; Muthivhi et al 2015; Jacobs et al 1995; Von Bukenya 2012 |
|  | Health check | Gobatto 1996 ; Von Bukenya 2012 |
|  | Money | Koster and Hassall 2011; Agasa and Likwela 2014; Kabinda 2014; Umeora et al 2005; Sekoni et al 2014; Salaudeen and Odeh 2011; Durosinmi et al 2003; Olaiya et al 2004; Muthivhi et al 2015; Asamoah-Akuoko et al 2016; Adewuyi and Olawumi 2006 |
|  | Non-cash compensation | Koster and Hassall 2011; Olaiya et al 2004; Asamoah-Akuoko et al 2016; Adewuyi and Olawumi 2006 |
|  | perceived health benefits | Jacobs et al 1995 |
|  | Know blood group | Gobatto 1996; Haoses-Gorases and Katjire 2013; Duboz et al 2010; Von Bukenya 2012 |
|  | Infectious disease screening | Nébié et al 2007; Gobatto 1996 ; Haoses-Gorases and Katjire 2013; Duboz et al 2010; Adewuyi and Olawumi 2006; Von Bukenya 2012 |
|  | Gift items | Gobatto 1996 ; Muthivhi et al 2015; Salaudeen and Odeh 2011  |
|  | Donor certificate | Gobatto 1996 ; Olaiya et al 2004; Jacobs et al 1995 |
|  | Awards; recognition | Olaiya et al 2004; Chandrasekar et al 2015 |
|  | Blood crediting | Gobatto 1996 ; Jacobs et al 1995 |
|  | Reimbursement of transport cost | Chandrasekar et al 2015 |
| ***Social Norms*** |
|  | Sense of belonging | Gobatto 1996  |
|  | Peer pressure or influence | Nébié et al 2007; Chandrasekar et al 2015 |
| ***Knowledge/Information*** |
|  | Information; knowledge on benefits of BT | Salaudeen and Odeh 2011 |
| Previous donation | Obi 2007 |
| If my health allows it | Asenso-Mensah et al 2014 |

***Key: BT = Blood Transfusion***

**Table 4. Deterrents to blood donation**

| **Deterrent** | **References** |
| --- | --- |
| ***Low self-efficacy*** |
|  | Low self-efficacy; lifestyle barriers | Haoses-Gorases and Katjire 2013; Muthivhi et al 2015 |
|  | Not enough blood | Rolseth al 2014; Umeora et al 2005; Duboz et al 2010; Muthivhi et al 2015; Alinon et al 2014 |
|  | Perceived poor health (making one unfit to donate) | Rolseth al 2014; Melku et al 2016; Umeora et al 2005; Sekoni et al 2014; Obi 2007; Muthivhi et al 2015; Agbovi 2006 |
|  | Fear of transmitting infection to recipient; being HIV positive  | Rolseth al 2014; Gobatto 1996; Umeora et al 2005 |
| Medical reasons | 24; Duboz et al 2010  |
| Low involvement  | Pule et al 2014; Haoses-Gorases and Katjire 2013; Duboz et al 2010; Muthivhi et al 2015; Alinon et al 2014; Agbovi 2006 |
| Inconvenience  | Pule et al 2014; Rolseth al 2014; Melku et al 2016; Haoses-Gorases and Katjire 2013; Salaudeen and Odeh 2011; Ahmed et al 2006; Duboz et al 2010; Muthivhi et al 2015; Mwaba and Keikelame 1995; Agbovi 2006; Natukunda et al 2015; Chandrasekar et al 2015 |
| Lack of marketing communications  | Muthivhi et al 2015 |
| ***Knowledge/Information*** |
|  | Lack of knowledge | Pule et al 2014; Haoses-Gorases and Katjire 2013; Muthivhi et al 2015; Adewuyi and Olawumi 2006 |
|  | Lack of information | Melku et al 2016; Haoses-Gorases and Katjire 2013; Salaudeen and Odeh 2011; Duboz et al 2010; Alinon et al 2014; Agbovi 2006; Chandrasekar et al 2015; von Zahran and von Ali 2013 |
|  | Unaware of need for blood | Muthivhi et al 2015 |
|  | Unaware of donation site | Muthivhi et al 2015; Haoses-Gorases and Katjire 2013 |
|  | General | Salaudeen and Odeh 2011; Muthivhi et al 2015 |
| ***Negative experience of blood service*** |
|  | Negative service experience | Muthivhi et al 2015 |
|  | Poor staff attitude | Kabinda 2014; Muthivhi et al 2015 |
|  | Servicescape  | Muthivhi et al 2015 |
|  | Payment of processing fee | Ottong et al 1997 |
| ***Fear*** |
|  | Fear | Pule et al 2014; Ottong et al 1997; Duboz et al 2010; Muthivhi et al 2015; Adegoke 2016; von Zahran and von Ali 2013 |
|  | Rumours and misconceptions | Ottong et al 1997; Muthivhi et al 2015  |
|  | Needles | Agasa and Likwela 2014; Melku et al 2016; Haoses-Gorases and Katjire 2013; Muthivhi et al 2015; Alinon et al 2014; Natukunda et al 2015 |
|  | Physical injury | Muthivhi et al 2015  |
|  | Non-specific | Gobatto 1996; Muthivhi et al 2015 |
|  | Reduced health after donation; falling sick | Rolseth al 2014; Agasa and Likwela 2014; Kabinda 2014; Melku et al 2016; Umeora et al 2005; Duboz et al 2010; Muthivhi et al 2015; Jacobs et al 1995; Alinon et al 2014; Agbovi 2006; Natukunda et al 2015; Adewuyi and Olawumi 2006 |
|  | Contagion; HIV infection | Gobatto 1996; Agasa and Likwela 2014; Haoses-Gorases and Katjire 2013; Umeora et al 2005; Sekoni et al 2014; Salaudeen and Odeh 2011; Olaiya et al 2004; Muthivhi et al 2015; Jacobs et al 1995; Agbovi 2006  |
|  | Fainting, dizziness, collapse, convulsion | Rolseth al 2014; Umeora et al 2005; Salaudeen and Odeh 2011; Olaiya et al 2004; Muthivhi et al 2015; Mwaba and Keikelame 1995 |
|  | Blood | Muthivhi et al 2015 |
|  | Testing for HIV, discovering illness, knowing HIV results; stigmatization | Gobatto 1996; Kabinda 2014; Haoses-Gorases and Katjire 2013; Umeora et al 2005; Obi 2007; Ahmed et al 2006; Muthivhi et al 2015; Mwaba and Keikelame 1995; Agbovi 2006 |
|  | Fear of harm from donation process | Salaudeen and Odeh 2011 |
|  | Losing blood frequent/large volume of donation | Rolseth al 2014; Gobatto 1996; Melku et al 2016; Mwaba and Keikelame 1995; Alinon et al 2014 |
|  | Pain | Mwaba and Keikelame 1995 |
|  | Fear of medical settings | Alinon et al 2014  |
|  | Fear that blood will be used for rituals or witchcraft, others | Gobatto 1996; Alinon et al 2014; Umeora et al 2005 |
|  | Lack of courage; general fear | Alinon et al 2014 |
|  | Not recovering after blood donation | Rolseth al 2014; Gobatto 1996 |
|  | Risk of ill health | Gobatto 1996; Sekoni et al 2014; Olaiya et al 2004 |
|  | Loss of manhood/ libido/impotence | Umeora et al 2005; Olaiya et al 2004; Nébié et al 2007 |
|  | Reduced life span/death | Gobatto 1996; Umeora et al 2005 |
|  | Sudden death | Olaiya et al 2004 |
|  | That donation results in weight loss | Melku et al 2016; Salaudeen and Odeh 2011; Olaiya et al 2004 |
| ***Negative attitudes*** |
|  | Negative attitudes | Muthivhi et al 2015 |
|  | Negative word of mouth | Melku et al 2016 |
|  | Scepticism or cynicism; mistrust | Muthivhi et al 2015; Chandrasekar et al 2015; von Zahran and von Ali 2013 |
|  | Outgroup prejudice | Muthivhi et al 2015 |
|  | Don’t like blood donation process, idea of giving blood | Melku et al 2016; Sekoni et al 2014; Jacobs et al 1995 |
| ***Personal values*** |
|  | Personal values | Muthivhi et al 2015 |
|  | Personal moral norms | Haoses-Gorases and Katjire 2013; Muthivhi et al 2015; Alinon et al 2014 |
|  | Religiosity (JW, Pentecostals/ Revival Church) | Koster and Hassall 2011; Agasa and Likwela 2014; Kabinda 2014; Melku et al 2016; Haoses-Gorases and Katjire 2013; Umeora et al 2005; Sekoni et al 2014; Obi 2007; 23; Muthivhi et al 2015; Alinon et al 2014; Agbovi 2006; Adegoke 2016 |
| ***Lack of, or ineffective, incentives***  |
|  | Monetary  | Kabinda 2014; Umeora et al 2005 |
|  | Non-monetary; lack of appreciation | Alinon et al 2014 |
|  | General  | Muthivhi et al 2015 |
| Previous deferral  |  |
| Not been asked or invited | Agasa and Likwela 2014; Rolseth al 2014; Sekoni et al 2014; Adewuyi and Olawumi 2006 |
| Difficult socio-economic factors  | Gobatto 1996; Agasa and Likwela 2014; Ahmed et al 2006; Duboz et al 2010  |
| Perceived physical and spiritual weakness after donation | Agasa and Likwela 2014; Sekoni et al 2014; Salaudeen and Odeh 2011; Ottong et al 1997; Alinon et al 2014 |
| Perceived sale of blood by hospital or staff | Agasa and Likwela 2014; Kabinda 2014; Alinon et al 2014; Agbovi 2006 |
| Cultural values; traditional norms | Haoses-Gorases and Katjire 2013; Umeora et al 2005; Alinon et al 2014; Adegoke 2016 |
| ***Others*** |
| Lack of family; spouses permission | Rolseth al 2014; Sekoni et al 2014 |
| Not related to patient; relation not needing blood | Umeora et al 2005; Obi 2007 |
| BT not medically helpful | Umeora et al 2005 |
| Don’t know my blood group | Sekoni et al 2014 |
| Availability of paid blood donors | Obi 2007 |

***Key: BT = Blood Transfusion; JW = Jehovah’s Witness***