

# Promoting the Propensity for Blood Donation Through the Understanding of Its Antecedents.

Roberta Guglielmetti Mugion (✉ [rguglielmetti@uniroma3.it](mailto:rguglielmetti@uniroma3.it))

University of Roma Tre <https://orcid.org/0000-0002-4976-9123>

Pasca Maria Giovina

Università degli Studi Roma Tre

Di Pietro Laura

Università degli Studi Roma Tre

Maria Francesca Renzi

Università degli Studi Roma Tre

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## Research article

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# Abstract

**Background.** The paper is aimed at understanding the main antecedents related to the blood donation propensity related to both donors and non-donors. With our research, we are going to analyse the two perspectives in order to identify similarities and differences concentrating on the Italian context. Our findings can be useful also in the COVID-19 epoch in which blood availability continue to be a primary need of hospitals. Blood is a vital resource that strongly affects the efficacy and sustainability of every national healthcare system and the system's ability to achieve the goal of universal coverage. This is especially true in the COVID-19 epidemic, in which there is the need for blood among hospitals.

**Methods.** The purpose of this paper is to understand the main antecedents of citizens' blood donation intention and the propensity to enhance word of mouth among both donors and non-donors. To fulfil this purpose, the Theory of Planned Behaviour is adopted as a theoretical lens. An empirical investigation was performed in Italy, adopting a mixed methods research design. First, a qualitative analysis was carried out through 30 in-depth interviews. Then, a survey was used to quantitatively investigate the intention to donate among both donors (N=173) and non-donors (N=87). A conceptual model was developed and tested through Structural Equation Modeling, developing a multi-group approach.

**Results.** The present study confirms the relations proposed by the Theory of Planned Behaviour, even though some differences between the two groups are shown. The construct Information and Communication is crucial for donors, non-donors, and non-donor inhibitors. Service quality has an impact on the propensity to generate Word Of Mouth.

**Conclusion.** This paper reveals the main differences between donor and non-donor perspectives. Fruitful insights for enhancing blood donation awareness are provided. Our findings can also be useful in the COVID-19 epidemic, in which there is more need for blood in hospitals.

## Background

Blood is a vital health care resource that strongly affects the efficacy and sustainability of every national healthcare system and the system's ability to achieve the goal of universal health coverage [1]. Unfortunately, blood is a limited resource that cannot be reproduced and presents a limited lifecycle from donation to utilization [2]. Guaranteeing access to sufficient and safe blood has become a pivotal issue for national governments, thus increasing the attention and importance of the blood donation phenomenon. In the majority of developed countries, donating blood is a voluntary, anonymous and unpaid activity; hence, it may be defined as a social activity that individuals carry out to positively contribute to human wellbeing. In particular, the WHO highlights that from 2008 to 2015, an increase of 11.6 million blood donations from voluntary non-remunerated donors was detected [3]. Nevertheless, the demand for blood is constantly increasing, and it will continue to grow in the next decades due to both stricter parameters to assure the safety of gathered blood [4] and the broader blood demand coming from the older population [5]. As pointed out by [6], all these aspects could generate a dangerous shortage of

available blood. Therefore, it is crucial to incentivize an increase in the number of citizens who voluntarily decide to contribute to donation, thus overcoming the deficiency of available blood and contributing to community well-being. To achieve the goal of building a stable base of blood donors, there are two main strategies: i) recruiting new donors, particularly among young generations, and ii) retaining donors and increasing their frequency of donation [7, 8].

As stated by the WHO and the International Federation of Red Cross and Red Crescent Societies (IFRC), *“building a sustainable base of safe blood donors requires a long-term approach that requires not only the establishment of an effective voluntary blood donor program but also an improved public awareness of the importance of blood donation as a social norm”* [9]. Abbasi et al. [10] pointed out that *“to meet the requirements for blood, 1% of the population needs to donate blood”*, and they identified a substantial inequity in the attitude towards voluntary blood donation between developed and developing countries.

It is essential to emphasize that the availability of blood is fundamental in first aid services, surgery, the treatment of certain diseases (e.g., oncological diseases), transplants and transfusions. Thus, self-sufficiency is certainly a crucial element both at the regional level and in individual hospitals, and hospitals have an increasing need for blood donations.

Regarding Italy, blood donation is a very complex process in which several public and private stakeholders are involved, including public hospitals, donation associations, private foundations and citizens. Concerning the legal viewpoint, Italian law states that blood donation is an unpaid activity for the engaged donors, and donors can only be compensated with low-cost services such as free breakfast or a discount voucher for theatres and cinemas. Moreover, Italian laws have defined very strict health requirements for being and becoming donors.

More specifically, the Lazio Region and mainly the city of Rome are a peculiar setting in which the blood emergency is becoming more severe, and therefore, blood donation is certainly a fundamental starting point. However, especially in the COVID-19 epidemic, the problem of blood donation is a national issue, and there is a need to continue blood donation to guarantee a safer environment and simultaneously increase the number of donors.

Blood donation cannot stop despite the severe measures planned to curb the COVID-19 epidemic. Indeed, in Italy, over 1800 patients a day need transfusions to survive. Thus, even in this state of emergency that hospitals currently have to deal with, donations cannot be ceased. In the first week of March 2020, due to the pandemic, donations fell by 10% across Italy. Some Italian foundations such as CIVIS (AVIS, C.R.I., FIDAS and FRATRES) and CNS (National Blood Center) have launched an invitation to donate and tempered the donors' anxiety about contagion. Indeed, there is no scientific evidence to demonstrate that COVID-19 can be transmitted through blood transfusions. The transfusion centres, as a precautionary measure, are organized to reinforce all safety measures and are planning donations by phone to avoid gatherings and contact among donors. Donating blood is safe, and going to donate blood falls into the categories of public utility activities. After the call to donate, a large influx of new and regular donors was

registered in all Italian regions, which made it possible to restore stocks and ensure interregional compensation if new shortages were registered (avis.it, centronazionaleangue.it, salute.gov.it, nursetimes.com).

The real problem is that, in ordinary situations (i.e., just before the COVID-19 epidemic), there was already a lack of donors compared to the real needs. Therefore, there is a need to investigate the propensity for donation among citizens to plan awareness actions and to identify the key factors and an effective incentive system to promote donation. Obviously, even if the data for this study were collected before the COVID-19 epidemic, it is worth emphasizing that we can consider them reliable in an emergency.

On this strength, the main purpose of this study is to understand the main antecedents of citizens' intention to donate blood and their propensity to enhance word of mouth to identify similarities and differences between donors and non-donors.

To achieve this goal, we developed an empirical study based on the Theory of Planned Behaviour (TPB) [11], which has had growing application within blood donation research [12, 13, 14, 15]. Moreover, we took into consideration other previous contributions of Guarnaccia et al. [16] on the differences between Italian donors and non-donors. A mixed methods approach [17] was adopted to study donors' and non-donors' intentions to donate. The qualitative phase was carried out by- conducting in-depth interviews, while the quantitative approach involved a double web survey. A conceptual model was developed and tested with a multigroup structural equation model.

The paper is structured as follows. Section 2 presents the literature review. Section 3 presents the methodological approach, including the research plan, data collection and analysis. The results of our empirical study are presented in Sect. 4. Section 5 provides a discussion and findings. Finally, Sect. 6 provides conclusions and managerial implications.

## **Main Document**

### 2. Literature review

Although there are many studies about blood donation, the majority of them were carried out in Anglo-Saxon countries [18], and there is a need to further investigate the phenomenon in other countries through the development of empirical studies to analyse the main antecedents of citizens' behavioural intention.

The Theory of Planned Behaviour [11] has been primarily used to analyse blood donation intention, as it provides interesting insights for studying the phenomenon. Several researchers have reported that the TPB can be used to determine the predictors of blood donation [19, 15]. In particular, Reid and Wood [8] recognize the TPB as "the more appropriate model for investigating blood donation". Hardeman et al. [20] emphasize the contribution of the TPB to the study of behavioural change interventions when the motivation to act is not known [12]. To analyse the intention to donate by using the lens of the TPB, it is necessary to consider three main factors: attitudes (overall evaluation of a specific behaviour), subjective

norms (beliefs about the importance of others' approval), and perceived behavioural control (beliefs about the ability undertake the proposed behaviour).

Through the lens of the TPB in the blood donation context, it is possible to notice that donation behaviour can be affected by a positive attitude towards donation, a positive evaluation of donation among others and the perceived control of the donation experience [21]. However, France et al. [22] stated that additional factors might affect people's motivations and behaviours regarding blood donation, emphasizing the need for new studies on this research topic. Similarly, Reid and Wood [8] suggested considering a broader set of variables to increase the usefulness of this kind of research. In line with this view, several authors [19,21,23,24,25,26,] proposed extended and more comprehensive versions of the model with the purpose of increasing the predictive power of the model [18]. For instance, Armitage and Conner [15] believe that the personal moral norm, namely, the sense of moral obligation, strongly impacts the intention to become a blood donor. Some authors [12, 15, 21] that perceived behavioural control should be replaced by the construct of self-efficacy [28], that is, one's perceived ability to perform the considered behaviour.

To predict the intention to donate blood, Williams et al. [29] integrated the TPB with the self-determination theory (SDT) motivational variables proposed by Hagger and Chatzisarantis [30, 31]. Following the idea of the authors, this theoretical integration offers a complementary approach to identify the elements of blood donors' behaviour, discovering that autonomous motivation has a positive direct effect on intention, as well as indirect effects via attitudes, subjective norms and perceived behavioural control. France et al. [32] introduced the "blood donation satisfaction" dimension as an antecedent of donor attitude; similarly, Schreiber et al. and Thomson et al. [33, 34] highlighted its influence on the retention of the donor's status over time. The possibility of "helping other people" or "altruism" seems to be one of the most relevant motivations for both first-time and repeat donors to donate blood [5].

Bednall et al. [18] emphasize that no previous studies have explored the effect of knowledge and awareness on donation behaviour, particularly taking into account and comparing donors versus non-donors. Other authors [21, 35] have investigated the influence of donation knowledge on the intention to donate. Sueming et al. [5] noticed that existing donors play an essential role in informing and motivating new volunteers. Williams et al. [29] suggested that developing "messaging designed to recognize and enhance an individual's autonomy in making the decision to donate again may be a more effective retention strategy than simply encouraging donors to return" [22].

Concerning the information about and the awareness of blood donating, Abbasi et al. [10] pointed out that social networks may be pivotal for disseminating information, quickly requesting blood donation requests and educating citizens.

Multiple studies have investigated how donation-related fear and anxiety can negatively affect both the recruitment and retention of new donors. Indeed, the fear of donating blood is one of the main deterrents of becoming donors, and as stated by France et al. [36], it has a direct effect on donor retention rates and an indirect effect on increasing the risk of syncopal episodes [37]. To better understand the causes of fear

and anxiety, it is useful to identify ad hoc strategies to attract new donors and keep them for years. In that sense, Charbonneau et al. [38] advise investigating the obstacles together with the demographic characteristics of donors. Nevertheless, the role of traditional forms of communication should be strengthened by individuals' word of mouth (WOM) and electronic WOM (e-WOM). Indeed, WOM and e-WOM have a significant influence on consumer behaviour and decision making [39]. In addition, several studies generally argued that WOM has a greater influence on behaviour compared to other sources due to the reliability and flexibility of interpersonal communication and due to personal sources being viewed as more trustworthy [40, 41]. For the above reasons, in the proposed conceptual framework, both communication and the propensity to generate WOM (face-to-face and via social networks) are included.

### 3. Theoretical gaps and Conceptual Framework

Thus, there is a large literature on blood donation, but several authors have asked for further empirical studies to identify a larger number of antecedents related to the intention to donate. Moreover, only a few studies have discussed the similarities and differences between donors and non-donors [16].

On this strength, our study aims to understand the main antecedents of citizens' intention to donate and the propensity to generate WOM and to compare these factors between donors and non-donors.

The contribution of the proposed conceptual model is the use of the TPB [11] in the blood donation context.

Hence, to achieve these aims, the following research hypotheses are posited:

H1: *Attitude* positively affects *Intention to donate*;

H2: *Subjective Norm* has a positive affect on *Intention*;

H3: *Perceived Behavioural Control* has a positive effect on *Intention*;

H4: *Communication* positively influences *Attitude*;

H5: *Communication* positively influences *Propensity to Generate WOM*;

H6: *Communication* affects *Inhibitors*;

H7: *Inhibitors* negatively influences *Intention*;

H8: *Intention* affects *Propensity to Generate WOM*.

H9: *Service Quality* has a positive effect on *Propensity to Generate WOM*.

Figure 1 illustrates these hypotheses in the conceptual model.

Figure 1. Conceptual model

## 4. Methods

An empirical study was conducted in Italy to better understand how to enhance citizens' intention to donate and to understand their propensity to donate. A mixed methods approach was planned and implemented. As highlighted by several authors [42, 43, 44, 45] the mixed methods approach combines qualitative and quantitative techniques to provide a more extensive and multifaceted analysis of a phenomenon. For this reason, in the last decade, the mixed methods approach has considered a methodological pillar [45, 46]. In particular, following the Priority-Sequence Model proposed by Morgan (1998) [17], a "qualitative preliminary approach" was adopted to guide the data collection in the principally quantitative step of the study.

Qualitative and quantitative surveys were conducted involving a sample of Italian citizens who were recruited in the country.

The sample of the qualitative survey was composed of donors (N = 15) and non-donors (N = 15).

The sample of the quantitative survey was composed of donors (N = 173) and non-donors (N = 87).

### 4.1 Research design, data collection, and analysis

The qualitative research aims to explore the phenomenon of blood donation by investigating multiple aspects among both donors and non-donors. In general, the purpose of the in-depth interviews was to analyse the strengths and weaknesses of the blood donation phenomenon and to compare them across both groups. For this reason, two different topic guides were developed to allow respondents to express themselves naturally. The interview topic guide was structured as follows: first, general questions on the phenomenon were posed to both groups, and then, some customized questions were posed based on the basis of the "status" of the respondent (donors/non-donors). In the case of the donors, the motivations for, experience of and satisfaction with donations were investigated, whereas obstacles, pitfalls and shortcomings were examined in depth for the non-donors. In both cases, suggestions to increase the propensity towards blood donation were assessed. The donors were randomly selected immediately after they donated at the blood transfusion centre of an Italian hospital located in the city of Rome or at a bloodmobile situated in the Rome area. The non-donor sample was randomly selected. In February 2018, 30 individuals underwent face-to-face interviews (15 = donors; 15 = no-donors). To analyse the collected qualitative data, a content analysis was performed using MAXQDA11 software.

Thereafter, integrating the literature review and the qualitative results, a quantitative analysis was planned to investigate the attitudes, motivations and behaviour of both donors and non-donors. Hence, two questionnaires were developed based on the Theory of Planned Behaviour, previous studies on the same topic [16] and the findings of the qualitative analysis.

The questionnaire was structured in 11 dimensions: Attitude, Subjective norm, Perceived behavioural control, Accessibility to donation, Inhibitors and obstacles to donation, Information and Communication,

Service quality, Intention and Propensity to generate word of mouth, personal characteristics, and Motivations.

The donors' questionnaire was composed of 94 items, whereas the non-donors' questionnaire comprised 87 items. There was also an additional open question, allowing participants to provide comments and suggestions. A seven-point Likert scale was adopted to gather responses (1="completely disagree" to 7="completely agree"). The dimensions proposed in the questionnaire are shown in Table 1, whereas in the Appendix I, all the items are reported.

The questionnaire was tested through a pilot survey on a sample of 30 respondents, after which the formulations of some questions were adapted to improve the clarity and consistency of items and dimensions. Then, the quantitative survey was administered via the web using the support of social networks as well as the institutional websites of blood donation associations and foundations (October-November 2018). The random sample used in this study was considered appropriate for addressing the aim of the research [47, 48], and the sample size is suitable for testing the statistical significance of the hypothesized relationships.

#### **Table I.** Questionnaire structure

Here, the semantic meaning of the proposed dimensions is explained.

"Attitude" towards blood donation assesses whether a respondent believes that this activity is ethical, safe, useful and a citizen's moral and social obligation. "Subjective norm" assesses beliefs about whether significant other people approve of and appreciate the behaviour of blood donation. Indeed, the construct is generated by the perception that other people appreciate blood donation and the recurrence of donating. "Perceived Behavioural Control" indicates the degree to which people think they can control a specific behaviour such as having the requisites and a lifestyle suitable for donating and not find it difficult to donate. "Information and Communication" assesses citizens' perceptions of the need to increase donation awareness through mass media, promotional campaigns on social networks and educational initiatives in schools/universities.

"Service quality" assesses the perceptions attributed to the kindness, competence and availability of medical staff. "Inhibitors" assesses some unpleasant sensations related to blood donation and personal fears related to blood donation (i.e., fainting, fear of the needle, sight of blood, pain). "Intention" assesses the willingness to donate more in the future (or for the first time) and more often even without receiving benefits (discounts, economic benefits, etc.).

"Propensity to Generate WOM" assesses respondents' intention to recommend blood donation to friends and family face-to-face and on social media and social networks.

The data analysis was carried out using the SPSS and SEM software packages [49]. Structural equation modelling (SEM) was used to verify the relations and test the conceptual model [50].

## 5. Results

This section presents the results of the qualitative survey (5.1) and the quantitative survey (5.2).

### 5.1 Qualitative results

During the preliminary qualitative phase of the analysis, 30 in-depth interviews were conducted (15 = donors; 15 = non-donors). The composition of the sample was balanced for pursuing explanatory power concerning different characteristics of the two distinct groups. The interviews were recorded and transcribed, and then, two researchers carried out the text analysis using MAXQDA11 software. Bias and subjective interpretations were eliminated, and the results were compared with the aim of identifying the key common aspects and priorities for both donor and non-donors. The main output of the qualitative analysis has been summarized by developing a cognitive map for donors and non-donors (Fig. 1, 2). The maps showed three main dimensions that arose from the qualitative interview analysis: i) Service quality, ii) Information and Communication and iii) Inhibitors.

The content analysis revealed that service quality aspects are pivotal for individuals who are engaged in the blood donation process. The donor respondents take into account waiting times to donate, the cleanliness of transfusion centres and the availability and professionalism of medical staff (Fig. 2). Moreover, the non-donors considered the security of transfusion centres and easy access to information about donation (e.g., places and times) as strengths of service quality. As highlighted in Fig. 3, the low propensity to donate among non-donors is justified by intimate psychological factors (i.e., needles, infectious diseases, the sight of blood), the physical factors that inhibit donation (e.g., low blood pressure and abnormal blood levels), the lack of communication and information about initiatives, the lack of interest and the lack of transparency in the system, which generates insecurity. Respondents argued that there is a low propensity to donate among young people due to the lack of information, disinterest and a loss of moral values. For donors, the main obstacles to donation are long queues, the location and accessibility of transfusion centres as well as lack of information and communication about blood donation events and initiatives. Both donors and non-donors suggested promoting communication related to blood donation events by not only using traditional word of mouth but also using advertising campaigns on social networks and educational events in schools and universities.

Figure 2. Donors, cognitive map

Figure 3. Non-donors, cognitive map

As shown below (Table II), both groups consider blood donation a personal responsibility (21) and a custom of altruism and generosity (18) that creates collective well-being. For donors, donation is a moral obligation (6). Donors believe in the intrinsic values of donation (7); they donate to help friends/family (6) or for external influences (2) such as meeting new people, having a free check-up or obtaining social recognition among friends/family. The main motivations for not donating are fear (8), which includes fear of needles, the sight of blood, bruising and adverse reactions or the lack of requisites to donate (3).

In addition, the non-donors do not donate due to the lack of transparency (2), which generates insecurity, or because they are not interested in blood donation (2). Donors are perceived as people with a healthy lifestyle (20), people who are altruistic (12) and people who are responsible (7). In addition, the non-donors perceive donors as courageous (3) and religious (2).

**Table II.** Qualitative survey, recurrent key issues of donors and non-donors

## 5.2 Quantitative results

The sample is composed of 260 respondents, divided into donors (N = 173) and non-donors (N = 87). Next, the results of the collected data from the two questionnaires are shown.

### 5.2.1 Sample description

The sample of donors is composed of 173 respondents, including 87 males (50.3%) and 86 females (49.7%) who belonged to the 18–24 (17.3%), 25–34 (38.7%), 35–44 (18.5%), 45–54 (19.1%), 55–64 (5.8%) and over 65 (0.6%) age ranges. High school is the most common level of education (60.1%). A total of 57.2% of donors are civil servants, and 24.3% are students.

An overview of the sample characteristics is shown in Table III. The other sample included 87 non-donors, of which 65.5% were females and 34.5% were males.

The majority of the sample (52.9%) is in the 25–34 age range. The other respondents belonged to the following age ranges: 18–24 (23%), 35–44 (13.8%), 45–54 (5.7%), 55–64 (2.3%) and over 65 (2.3%). The majority of the sample had a bachelor's degree (36.8%); 43.7% were civil servants, 34.5% were students, and 10.3% were unemployed.

**Table III.** Demographic characteristics of the sample.

Table IV shows the distribution of the respondents across Italian regions. The regions with the major number of respondents are Veneto (25.4%), Piedmont (17.9%), Lazio (17.9%) and Puglia (11.6%).

**Table IV.** Distribution for Italian Region

Table V shows the recurrent motivations for donating the first time and the favourite locations among donors.

**Table V.** Donors' Motivations

Table VI shows the recurrent motivations for donating the first time and the favourite locations among non-donor.

**Table VI.** Non- Donors' Motivations

### 5.2.2 Donors' and non-donors' internal reliability and validity

Regarding the donor dataset, the internal reliability of each factor was calculated using Cronbach's alpha coefficient [51] and the construct validity was calculated using Convergent Variance Extracted (AVE) and Composite Reliability (CR). Table VII shows the construct validity and reliability values.

**Table VII.** Construct reliability and validity (Model A, donors)

All the data meet the criteria for acceptable reliability and validity: 0.7 for Cronbach's alpha [52, 53, 54], 0.5 for AVE and 0.7 for CR [55].

Additionally, for the non-donor dataset, the reliability and validity were calculated using the same measures. The findings are shown in Table VIII.

**Table VIII.** Construct reliability and validity (Model B, non-donors)

As shown in Table VIII, the data meet the criteria for acceptable reliability and validity [52–54].

## 5.2.3 Structural Equation Models: multi-group analysis

The conceptual model was tested with SEM using *Mplus 7* software.

The adopted procedure is as follows. First, we separately developed models for Group A, i.e., the donors (N = 173), and Group B, i.e., the non-donors (N = 87). Then, we used multigroup analysis to simultaneously identify the main differences between the two independent samples. A graphical representation of the models and the goodness-of-fit indexes are proposed. The robust estimator MLMV was used for continuous variables to correct covariance. Table IX shows the results of the goodness-of-fit parameters. Then, a graphical representation of the measurement models is proposed for both groups. The models are shown in Fig. 4 (Group A, donors) and Fig. 5 (Group B, non-donors).

The results of the SEM goodness-of-fit parameters are presented below.

- *Root mean square error of approximation* (RMSEA = 0.073; 90% C.I. = 0.066;0.080): acceptable according to Browne and Cudeck [56];
- *Critical fit index* (CFI = 0.915): acceptable according to Bentler [57];
- *Tucker-Lewis index* (TLI = 0.901): acceptable according to Tanaka [58];
- *Standardized root mean square residual* (SRMR = 0.062): acceptable according to Hu and Bentler [59].

**Table IX.** Goodness-of-fit index model

The analysis confirms that the  $\chi^2$  (chi-squared) value is significant with its linked probability value. The  $\chi^2$  test was statistically significant, which indicates an unsuitable fit, even if, according to several authors, it needs to be compared with other indexes before rejection [58, 59, 60, 61].

The other indicators of goodness of fit can be considered adequate since all the values fall within the thresholds suggested by the literature.

Here, the graphical representation of the model is shown for both donors (Fig. 4) and non-donors (Fig. 5).

The graphs represent only the significant relations between factors ( $p < 0.05$ ).

Figure 4. The conceptual model validated through SEM, Group A, donors

The observed model of Group A shows that there is covariance between Subjective Norm and Perceived Behavioural Control, as in the model previously tested by Ajzen [11].

Figure 5. The conceptual model validated through SEM, Group B, non-donors

The observed model of Group B shows that there is covariance between Subjective Norm and Perceived Behavioural Control, as in the model previously tested by Ajzen [11], as well as between Perceived Behavioural Control and Communication.

The results of the two models are summarized below in Tables X and XII. It is possible to notice that the indicators have significant loadings on their assigned constructs. The residual variances are reported in Appendix II.

**Table X.** Factor loadings statistics, Group A, Donors

**Table XI.** Factor loadings statistics, Group B, non-donors

The main results and the status of the research hypotheses are summarized in Table XII (Group A, donors) and Table XIII (Group B, non-donors).

**Table XII.** Status of research hypotheses, Group A, Donors

Regarding the donors, all the proposed hypotheses are supported ( $p$ -value  $< 0.005$ ), except H2, H6 and H7. In particular, Subjective Norm ( $p = 0.705$ ) does not affect Intention or Inhibitors ( $p = 0.517$ ). In addition, Communication does not influence Inhibitors (0.271). Attitude (H1) and Perceived Behavioural Control (H3) directly influence Intention. Communication affects Attitude (H2) and Propensity to Generate WOM (H6), which is also positively affected by Intention (H8) and Service Quality (H9).

**Table XIII.** Status of research hypotheses, Group B, Non-donors

Regarding the non-donors, all the proposed hypotheses are supported ( $p$ -value  $< 0.005$ ), except H1 and H7. In particular, the construct Inhibitors ( $p = 0.493$ ) is not significant for non-donor respondents. Concerning the construct Attitude, its  $p$ -value can be considered marginally significant ( $p = 0.054$ ), and for the principle of conservation, we decided to accept H1.

Thus, Attitude (H1), Subjective norm (H2) and Perceived Behavioural Control (H3) directly influence Intention. Communication is a predictor of both Attitude (H2) and Inhibitors (H6). Propensity to Generate WOM is predicted by Intention (H8), Service Quality (H9) and Communication (H5).

The observed model in Group A (donors) shows that Attitude (0.441) and Perceived Behavioural Control (0.553) directly and positively influence Intention (H1, H3). Communication has a strong impact on Attitude (1.005) and on Propensity to Generate WOM (0.494) (H4, H5). Propensity to Generate WOM is predicted by Intention (0.216), Service Quality (0.268) and Communication (0.494) (H8, H9, H5). However, Subjective Norm (-0.031) and Inhibitors (-0.025) do not significantly affect Intention to donate (H2, H7), and Communication (-0.066) does not significantly affect Inhibitors (H6) ( $p > 0.05$ ).

Concerning the observed model in Group B (non-donors), the results reveal that Subjective Norms (0.346), Perceived Behavioural Control (0.410) and Attitude (0.052) affect Intention to donate (H2, H3, H1).

Communication positively influences Attitude (1.000) and Inhibitors (0.183) (H4, H6). Communication (0.505), Intention (0.174) and Service Quality (0.209) affect Propensity to Generate WOM. However, Inhibitors (-0.039) does not affect Intention to donate (H7).

## 6. Discussion

The proposed conceptual model was simultaneously tested on two independent samples of donors and non-donors, and the results are very interesting. First, the goodness of fit indexes can be considered adequate in accordance with the literature thresholds. Thus, the conceptual model is validated by our data. Some differences and similarities in the antecedents of blood donation are found between the two groups.

Regarding the donors (Group A), all the proposed hypotheses are supported, except H2, H6 and H7.

The observed model in Group A (donors) shows that Attitude (0.441) and Perceived Behavioural Control (0.553) directly and positively influence Intention (H1, H3). Communication has a strong impact on Attitude (1.005) and on Propensity to Generate WOM (0.494) (H4, H5). Propensity to Generate WOM is predicted by Intention (0.216), Service Quality (0.268) and Communication (0.494) (H8, H9, H5). However, Subjective Norm (-0.031) and Inhibitors (-0.025) do not significantly affect Intention to donate (H2, H7), and Communication (-0.066) does not significantly affect Inhibitors (H6) ( $p > 0.05$ ).

In particular, Subjective Norm does not affect Intention or Inhibitors. In addition, Communication does not influence Inhibitors (0.271).

Moreover, Attitude (H1) and Perceived Behavioural Control (H3) directly influence Intention.

Communication affects Attitude (H2) and Propensity to Generate WOM (H6), which is also influenced by Intention (H8) and Service Quality (H9).

Hence, the results related to the donor model (Group A) show that Attitude and Perceived Behavioural Control are antecedents of Intention to donate (again). Moreover, the results reveal that Inhibitors do not influence Intention to donate, which makes sense in the case of donors. Communication and Information, which has no impact on Inhibitors, affects Attitude and Propensity to Generate WOM, and Propensity to Generate WOM is affected by Intention and Service Quality.

Regarding the non-donors (Group B), all the proposed hypotheses are supported, except H1 and H7. In particular, the results reveal that Subjective Norms (0.346), Perceived Behavioural Control (0.410) and Attitude (0.052) affect Intention to donate (H2, H3, H1). Communication positively influences Attitude (1.000) and Inhibitors (0.183) (H4, H6). Communication (0.505), Intention (0.174) and Service Quality (0.209) affect Propensity to Generate WOM. However, Inhibitors (-0.039) does not affect Intention to donate (H7). In particular, Inhibitors is not a significant antecedent of Intention to donate among non-donor respondents. Attitude (H1), Subjective norm (H2) and Perceived Behavioural Control (H3) directly influence Intention to donate (for the first time). Even among non-donors, Information and Communication predict both Attitude (H2) and Inhibitors (H6). Regarding Propensity to generate WOM, there are three main predictors: Intention (H8), Service Quality (H9) and Communication (H5). The non-donors' Propensity to generate WOM is affected by their Intention and by the importance they give to Service Quality. Among non-donors, Attitude is also influenced by Communication, and Communication has a positive impact on Inhibitors and Propensity to Generate WOM.

It is worth emphasizing that the present study confirms the relations suggested by the TPB model and applies them to blood donation, where *i*) Attitude towards blood donation assesses whether a respondent believes that this activity is ethical, safe, useful and a citizens' moral and social obligation, *ii*) Subjective norm assesses beliefs about whether significant other people approve of and appreciate the behaviour of blood donation, *iii*) Perceived Behavioural Control assesses the degree to which people think they can control a specific behaviour such as having the requisites and a lifestyle suitable to donate and not find any difficulty to donate, *iv*) Intention assesses the willingness to donate again (donors) or for the first time (non-donors), and *v*) Propensity to Generate WOM assesses one's recommendation to donate blood among friends and family using social networks.

The following constructs are antecedents of Intention to donate:

*i*) Group A, donors: Attitude and Perceived Behavioural Control.

1. *ii*) Group B, non-donors: Attitude, Perceived Behavioural Control and Subjective Norm.

The non-donor model confirms the acknowledged relations proposed previously by the TPB model.

Nevertheless, some new constructs were included in our study to fill the gaps in knowledge identified in our literature review.

Thus, our findings suggest that the construct Information and Communication is crucial for both donors and non-donors, indicating that there is a need to increase donation awareness through mass and social

media, through developing promotional campaigns mainly on social networks and through promoting educational activities in schools and universities. This centralized process of mass and virtual communication could have a positive impact not only in engaging new donors among young people and millennials but also in recruiting previous donors.

Inhibitors was not a significant predictor or intention in either group; while this makes sense for donors, it creates more concerns for non-donors. Inhibitors take into account unpleasant sensations related to the blood draw and personal fears related to the blood draw (i.e., fainting, fear of the needle, sight of blood, pain). A possible explanation could be that people who are affected by inhibitors are more difficult to recruit and sensitize, and even though information and communication can have an influence on Inhibitors, it is probably not sufficient to convince non-donors to donate. Thus, people who have inhibitors related to blood donation cannot be easily converted into donors.

Assessments of Service Quality include the individual's perceptions of the kindness, competence and availability of medical staff, waiting times for donation, cleanliness of transfusion centres and ease of finding information on places and times where donation occurs. It is vital to enhance the propensity to generate WOM among donors. Indeed, donation centres need to improve the quality of their services to be more attractive for donors. The medical staff must be kind, available and organized to reduce waiting times. Donation centres should be clean and provide information on days and places where people can donate, preferably giving appointments to donors via the web.

## **Conclusion**

### **7.1 Originality, limitations and future perspectives**

From an academic viewpoint, the originality of the study is that it proposes an analysis of the phenomenon of blood donation in Italy to understand the antecedents of citizens' intention to donate and their propensity to generate WOM.

The results of the research show that there are differences and similarities in the antecedents of blood donation among donor and non-donor groups.

Our findings confirmed the relations identified by previous studies [11], namely, Attitude and Perceived Behavioural Control are predictors of intention for donors, whereas Attitude, Subjective Norm and Perceived Behavioural Control are the main predictors for non-donors. These findings are aligned with previous studies that have implemented the TPB model for blood donation [15, 19].

The present study suggests that Service Quality is an important dimension for both donors and non-donors. This is aligned with the hypothesis of Pagliariccio and Marinozzi [62] concerning the positive influence of donation satisfaction on the behaviour to donate again.

Regarding Inhibitors, (i.e., fear of needles, the sight of blood, concern about pain, bruising and adverse reactions), they are not significant for either donors or non-donors. Although non-donors cannot be easily converted into donors because they cannot overcome those obstacles [63, 64, 65], information and communication could sensitize them to blood donation. As non-donors, they can generate WOM for blood donation.

Information and Communication is a predictor of intention to donate for both donors and non-donors, indicating that there is a need to increase donation awareness through mass and social media, through developing promotional campaigns mainly on social networks and through promoting educational activities in schools and universities. Communication should promote donations mainly among young adults, provide clear and educative information, explain the process of donation and the concrete experience, describe legal health requirements, and ensure citizens that the donation process is safe, especially during the COVID-19 epidemic. This centralized process of mass and virtual communication could have a positive impact for recruiting new donors among young people and millennials but also in recruiting previous donors.

Blood donation organizations should implement awareness-raising initiatives to motivate citizens to donate. Recruitment campaigns are needed at schools and universities to motivate young people, and these campaigns can be mainly virtual using the web and social media/networks.

Despite the importance of the main findings of this study, some limitations exist and should be overcome by future studies. First, the sample only includes Italian citizens, but it can be enlarged to other countries since it can be useful to investigate different cultural viewpoints. Indeed, as stated by Suemnig et al. [5], the factors that affect behaviours among donors and non-donors can vary on the basis of sociodemographic features such as cultural background (age, gender, etc.). Hence, future research may investigate and compare the phenomenon in different cultural contexts to generalize the factors that encourage citizens to donate over time.

## **7.2 Managerial implications**

Our findings can provide useful insights at different levels (macro, meso and micro), and they can be beneficial even in the COVID-19 epidemic.

At the macro level, including the government and policy makers such as the Health Ministry, our study highlights the vital role of information and communication for developing effective strategies to promote blood donations in the Italian community. Moreover, social media and networks can play a fundamental role in promoting blood donation activity through educational activities.

The macro level should provide the main guidelines to the meso level, which is represented by companies, healthcare organizations, schools and universities.

More specifically, in the era of smart working and e-learning, the realization and administration of educational videos and/or e-seminars on blood donation should be worthwhile for converting non-donors

into donors and to reinvigorate previous donors. The information and communication should be clear and detailed regarding the procedures and the safety of the process, guaranteeing safeguard and protections to donors.

Furthermore, our study suggests to healthcare organizations and blood associations that the Service Quality of blood centres may influence the propensity to generate WOM, which is another way to indirectly promote blood donation. Thus, it is crucial to invest resources in improving the service quality of blood centres.

Finally, at the micro level, our results allowed us to better understand individuals' behaviour related to blood donation both for donors and non-donors, indicating the role of inhibitors that seem to be the strong barrier for non-donors, even though communication and information could support overcoming them in the long term.

All the above implications should be considered in the current COVID-19 epidemic, in which there is a growing need for having available blood in hospitals, especially considering the increased number of hospitalized people. The role of the macro level is crucial for proposing effective and efficient strategies able to promote blood donation as much as possible, orienting the meso level to make concrete actions to educate citizens, especially young people and millennials.

## **Abbreviations**

SEM

Structural Equation Modelling

SDT

Self-determination Theory

TPB

Theory of Planned Behaviour

WOM

word of mouth; e-WOM = electronic WOM

WHO

World Health Organization

## **Declarations**

## **Ethics approval and consent to participate**

Ethics approval unnecessary according to national regulations

## **Consent for publication**

Not applicable

### **Availability of data and material**

Both the questionnaire and the interview guide used in your study were developed for this study and they were not has previously been published elsewhere.

## **Competing interests**

The authors declare that there are not financial and non-financial competing interests.

## **Funding**

No funding was obtained for this study.

## **Authors' contributions**

RGM had the original idea for the study and designed the quantitative study. LDP designed and collected data for the qualitative study. RGM and MGP analysed the quantitative data, LDP and MGP analysed the qualitative data. All authors contributed to interpretation of datasets. RGM wrote the first draft of the paper, MGP, LDP and MFR commented on subsequent drafts. All authors have read and approved the final manuscript.

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## Tables

**Table I.** Questionnaire structure

Dimension	N. item	References
<i>Attitude</i>	6	[11]
<i>Subjective norm</i>	3	[11]
<i>Perceived behavioural control</i>	3	[11]
<i>Personal characteristics</i>	5	Qualitative phase
<i>Accessibility to the donation</i>	8	Qualitative phase
<i>Inhibitors</i>	7	[16] Qualitative phase
<i>Information and Communication</i>	4	Qualitative phase
<i>Service quality</i>	4	[32,66,67]
<i>Intention to donate</i>	3	[16]
<i>Propensity to generate WOM</i>	2	[16]

**Table II.** Qualitative survey, recurrent key issues of donors and non-donors

<i>DONORS</i>		<i>NON-DONORS</i>	
The donation is:	Frequency	The donation is:	Frequency
<i>a personal responsibility</i>	11	<i>a personal responsibility</i>	10
<i>a form of altruism</i>	9	<i>a form of altruism</i>	9
<i>a moral obligation</i>	6	<i>a moral obligation</i>	3
<b>Motivations to donate:</b>		<b>Motivations not to donate:</b>	
<i>personal values</i>	7	<i>fear</i>	8
<i>to help friends and family</i>	6	<i>requisites to donate</i>	3
<i>external influences</i>	2	<i>trasparency</i>	2
		<i>interest</i>	2
<b>The donator is a person:</b>		<b>The donator is a person:</b>	
<i>with a healthy lifestyle</i>	7	<i>with a healthy lifestyle</i>	13
		<i>altruistic</i>	6
<i>altruistic</i>	6	<i>responsible</i>	4
<i>responsible</i>	3	<i>courageous</i>	3
		<i>religious</i>	2

**Table III.** Demographic characteristics of the sample.

Demographic characteristics		Sample's specifics			
		<i>Donors (N=173)</i>		<i>Non-donors (N=87)</i>	
		<i>Frequency</i>	<i>Percentage</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Gender</i>	Male	87	50.3%	30	34.5%
	Female	86	49.7%	57	65.5%
<i>Age</i>	18-24	30	17.3%	20	23.0%
	25-34	67	38.7%	46	52.9%
	35-44	32	18.5%	12	13.8%
	45-54	33	19.1%	5	5.7%
	55-64	10	5.8%	2	2.3%
	>65	1	0.6%	2	2.3%
	<i>Educational level</i>	Elementary school	17	9.8%	/
High school		104	60.1%	30	34.5%
Bachelor's		19	11.0%	32	36.8%
Master's		25	14.5%	19	21.8%
MBA		7	4.0%	5	5.7%
PhD		1	0.6%	1	1.1%
<i>Job</i>	Civil servant	99	57.2%	38	43.7%
	Private sector employee	13	7.5%	8	9.2%
	Student	42	24.3%	30	34.5%
	Unemployed	17	9.8%	9	10.3%
	Retiree	2	1.2%	2	2.3%

**Table IV. Distribution in Italy Regions**

<b>Region</b>	<b>Frequency</b>	<b>Percentage</b>
Veneto	44	25.4%
Piedmont	31	17.9%
Lazio	31	17.9%
Puglia	20	11.6%
Sicily	11	6.4%
Basilicata	10	5.9%
Friuli Venezia Giulia	6	3.5%
Liguria	5	2.8%
Emilia Romagna	3	1.7%
Abruzzo	3	1.7%
Campania	2	1.2%
Calabria	2	1.2%
Valle d'Aosta	1	0.6%
Sardinia	1	0.6%
Reggio Calabria	1	0.6%
Marche	1	0.6%
Lombardy	1	0.6%

**Table V.** Donors' Motivations

<b>Donors</b>			
<b>Motivation for first donation:</b>	<b>Frequency</b>	<b>Favourite location for donating blood</b>	<b>Frequency</b>
Individual choice	64	School/universities	77
Educational initiatives	29	City centre areas (plaza or parks)	42
Accompanying relatives/friends	23	In the office	24
Sensitive campaign	23	Sport centre	12
Blood need for relatives/friends	14	Hospitals	7
Being a parent of a donor	8	Blood donation centre	2
Altruism	6	Churches	2
Being a friend of a donor	2	Everywhere	2
Free breakfast	1	Place with parking	2
Familiar education	1	Associations	1
Personal motivation	1	Mall	1
Personal satisfaction	1	Game rooms	1

**Table VI.** Non- Donors' Motivations

<b>Non-donors</b>			
<b>Motivations for starting the donation</b>	<b>Frequency</b>	<b>Favourite location for donating blood</b>	<b>Frequency</b>
My parents/friend need blood	47	Doesn't matter	45
Sensitive campaigns	18	Blood donation centre	34
Supporting those who are in need	9		
For ethical reasons	6	Association centre	5
Educational event at school/university	3		
Accompanying parents/friends	3	Mobile blood station	3
Overcoming my fears	1		

**Table VII.** Construct reliability and validity (Model A, donors)

<b>Factor</b>	<b>Cronbach's alpha</b>	<b>AVE</b>	<b>CR</b>
<i>Attitude</i>	0.910	0.638	0.913
<i>Subjective norm</i>	0.872	0.695	0.871
<i>Perceived behavioural control</i>	0.842	0.619	0.828
<i>Inhibitors</i>	0.897	0.639	0.898
<i>Information and Communication</i>	0.941	0.759	0.926
<i>Service Quality</i>	0.934	0.816	0.930
<i>Intention</i>	0.777	0.553	0.784
<i>Propensity to Generate WOM</i>	0.891	0.821	0.901

**Table VIII.** Construct reliability and validity (Model B, non-donors)

<b>Factor</b>	<b>Cronbach's Alpha</b>	<b>AVE</b>	<b>CR</b>
<i>Attitude</i>	0.880	0.562	0.884
<i>Subjective norm</i>	0.804	0.547	0.783
<i>Perceived behavioural control</i>	0.750	0.584	0.806
<i>Inhibitors</i>	0.840	0.575	0.868
<i>Information and Communication</i>	0.900	0.671	0.889
<i>Service Quality</i>	0.900	0.734	0.892
<i>Intention</i>	0.753	0.625	0.826
<i>WOM</i>	0.841	0.731	0.844

**Table IX.** Goodness-of-fit index model

Goodness-of-fit index	Observed value	Commonly used threshold value
$\chi^2$ (Chi-squared)	934.259*	[58,59,60,61]
degrees of freedom	760	
p-value	0.000	
$\chi^2$ (Chi-squared) contribution group A	481.191	[68]
$\chi^2$ (Chi-squared) contribution group B	453.068	
SRMR (Standardized root mean square residual)	0.074	<0.08 [60]
CFI (Comparative fit index)	0.907	$\geq 0.90$ [57]
TLI (Tucker-Lewis index)	0.901	$\geq 0.90$ [58]
RMSEA (Root mean square error of approximation)	0.042	<ul style="list-style-type: none"> <li>• &lt; 0.05: minimal error</li> <li>• <math>0.05 \leq \text{RMSEA} \leq 0.08</math> acceptable</li> <li>• <math>\geq 0.08</math> rejectable model</li> </ul>
90% C.I. = (0.066;0.080)	(0.032-0.051)	[56]
WRMR (Weighted root mean square residual)	0.985	< 1 [69]

**Table X.** Factor loadings statistics, Group A, Donors

<b>Constructs</b>	<b>Code</b>	<b>Standardized loading</b>	<b>Measurement error variance</b>	<b>P-value</b>
Attitude	ATT_1	0.752	0.048	0.000
	ATT_2	0.834	0.035	0.000
	ATT_3	0.779	0.045	0.000
	ATT_4	0.817	0.038	0.000
	ATT_5	0.905	0.023	0.000
	ATT_6	0.687	0.043	0.000
Subjective Norm	SN_1	0.711	0.041	0.000
	SN_2	0.850	0.036	0.000
	SN_3	0.925	0.018	0.000
Perceived Behavioural Control	PBC_1	0.673	0.043	0.000
	PBC_2	0.793	0.032	0.000
	PBC_3	0.880	0.030	0.000
Inhibitors	INHI_1	0.877	0.025	0.000
	INHI_2	0.880	0.024	0.000
	INHI_3	0.799	0.028	0.000
	INHI_4	0.666	0.045	0.000
	INHI_5	0.756	0.032	0.000
Information and Communication	COM_1	0.909	0.019	0.000
	COM_2	0.965	0.011	0.000
	COM_3	0.761	0.035	0.000
	COM_4	0.836	0.030	0.000
Service Quality	SQ_1	0.903	0.019	0.000
	SQ_2	0.865	0.041	0.000
	SQ_3	0.941	0.016	0.000
Intention	INT_1	0.892	0.026	0.000
	INT_2	0.633	0.046	0.000
	INT_3	0.680	0.071	0.000
WOM	WOM_1	0.955	0.015	0.000

WOM_2	0.854	0.041	0.000
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**Table XI.** Factor loadings statistics, Group B, non-donors

<b>Constructs</b>	<b>Code</b>	<b>Standardized loading</b>	<b>Measurement error variance</b>	<b>P-value</b>
Attitude	ATT_1	0.668	0.036	0.000
	ATT_2	0.730	0.032	0.000
	ATT_3	0.742	0.033	0.000
	ATT_4	0.764	0.038	0.000
	ATT_5	0.851	0.024	0.000
	ATT_6	0.729	0.032	0.000
Subjective Norm	SN_1	0.688	0.039	0.000
	SN_2	0.804	0.041	0.000
	SN_3	0.722	0.039	0.000
Perceived Behavioural Control	PBC_1	0.827	0.028	0.000
	PBC_2	0.801	0.036	0.000
	PBC_3	0.652	0.034	0.000
Inhibitors	INHI_1	0.813	0.034	0.000
	INHI_2	0.898	0.023	0.000
	INHI_3	0.731	0.034	0.000
	INHI_4	0.543	0.045	0.000
	INHI_5	0.759	0.039	0.000
Information and Communication	COM_1	0.900	0.022	0.000
	COM_2	0.922	0.020	0.000
	COM_3	0.736	0.041	0.000
	COM_4	0.694	0.040	0.000
Service Quality	SQ_1	0.807	0.028	0.000
	SQ_2	0.860	0.021	0.000
	SQ_3	0.901	0.023	0.000
Intention	INT_1	0.905	0.028	0.000
	INT_2	0.883	0.018	0.000
	INT_3	0.526	0.041	0.000
WOM	WOM_1	0.885	0.032	0.000

WOM_2	0.824	0.028	0.000
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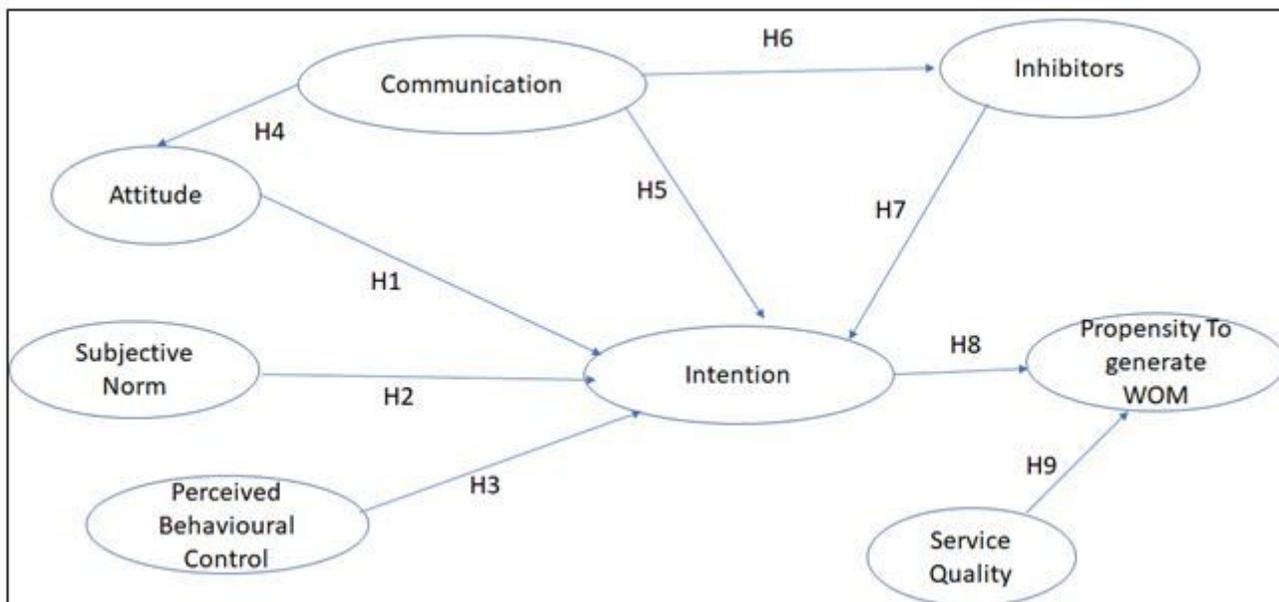
**Table XII.** Status of research hypotheses, Group A, Donors

Hypothesis	Predictor	Dependent variable	Estimate	S.E.	Two-tailed p-value	Supported
H1	<i>Attitude</i>	<i>Intention</i>	0.441	0.136	0.001	Yes
H2	<i>Subjective Norm</i>	<i>Intention</i>	-0.031	0.083	0.705	No
H3	<i>Perceived Behavioural Control</i>	<i>Intention</i>	0.553	0.121	0.000	Yes
H4	<i>Communication</i>	<i>Attitude</i>	1.005	0.052	0.000	Yes
H5	<i>Communication</i>	<i>WOM</i>	0.494	0.076	0.000	Yes
H6	<i>Communication</i>	<i>Inhibitors</i>	-0.066	0.060	0.271	No
H7	<i>Inhibitors</i>	<i>Intention</i>	-0.025	0.039	0.517	No
H8	<i>Intention</i>	<i>WOM</i>	0.216	0.069	0.002	Yes
H9	<i>Service Quality</i>	<i>WOM</i>	0.268	0.079	0.001	Yes

**Table XIII.** Status of research hypotheses, Group B, Non-donors

Hypothesis	Predictor	Dependent variable	Estimate	S.E.	Two-tailed p-value	Supported
H1	<i>Attitude</i>	<i>Intention</i>	0.052	0.078	0.054	Yes
H2	<i>Subjective Norm</i>	<i>Intention</i>	0.346	0.106	0.001	Yes
H3	<i>Perceived Behavioural Control</i>	<i>Intention</i>	0.410	0.081	0.000	Yes
H4	<i>Communication</i>	<i>Attitude</i>	1.000	0.097	0.000	Yes
H5	<i>Communication</i>	<i>WOM</i>	0.505	0.088	0.000	Yes
H6	<i>Communication</i>	<i>Inhibitors</i>	0.183	0.062	0.003	Yes
H7	<i>Inhibitors</i>	<i>Intention</i>	-0.039	0.057	0.493	No
H8	<i>Intention</i>	<i>WOM</i>	0.174	0.066	0.009	Yes
H9	<i>Service Quality</i>	<i>WOM</i>	0.209	0.107	0.052	Yes

## Figures



**Figure 1**

## Conceptual model

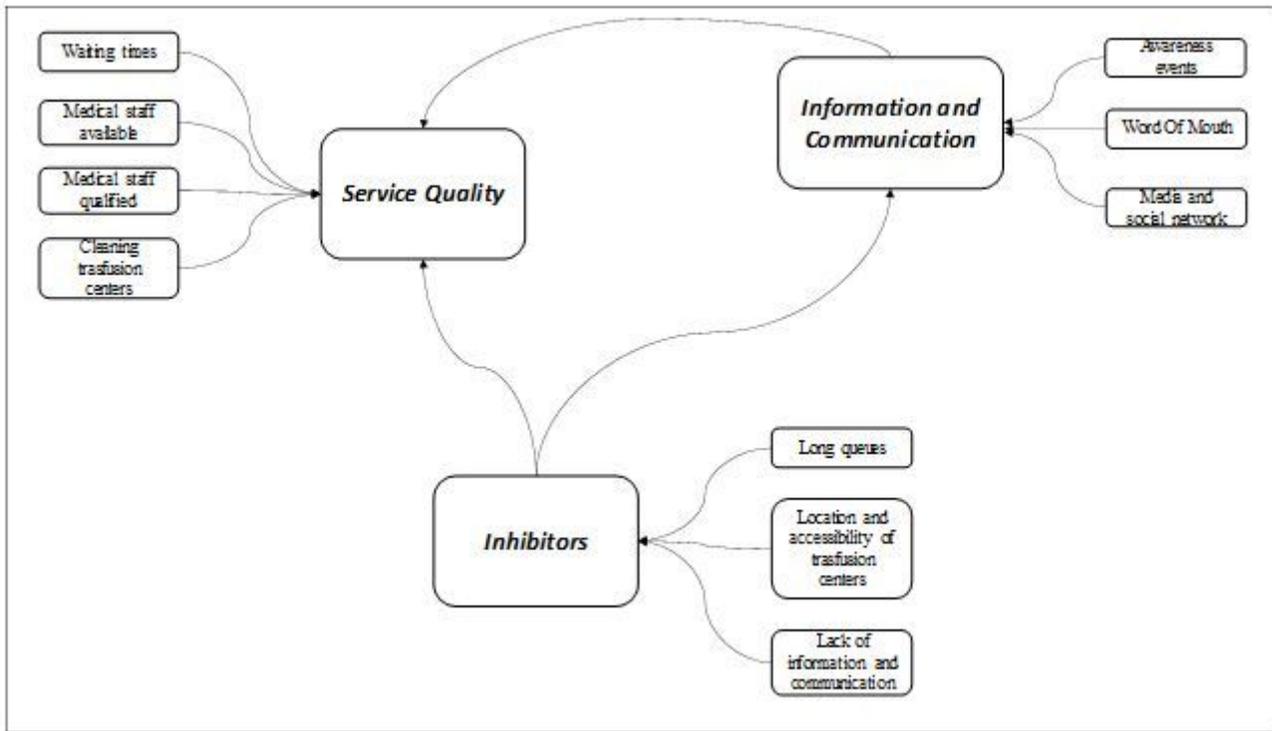


Figure 2

## Donors, cognitive map

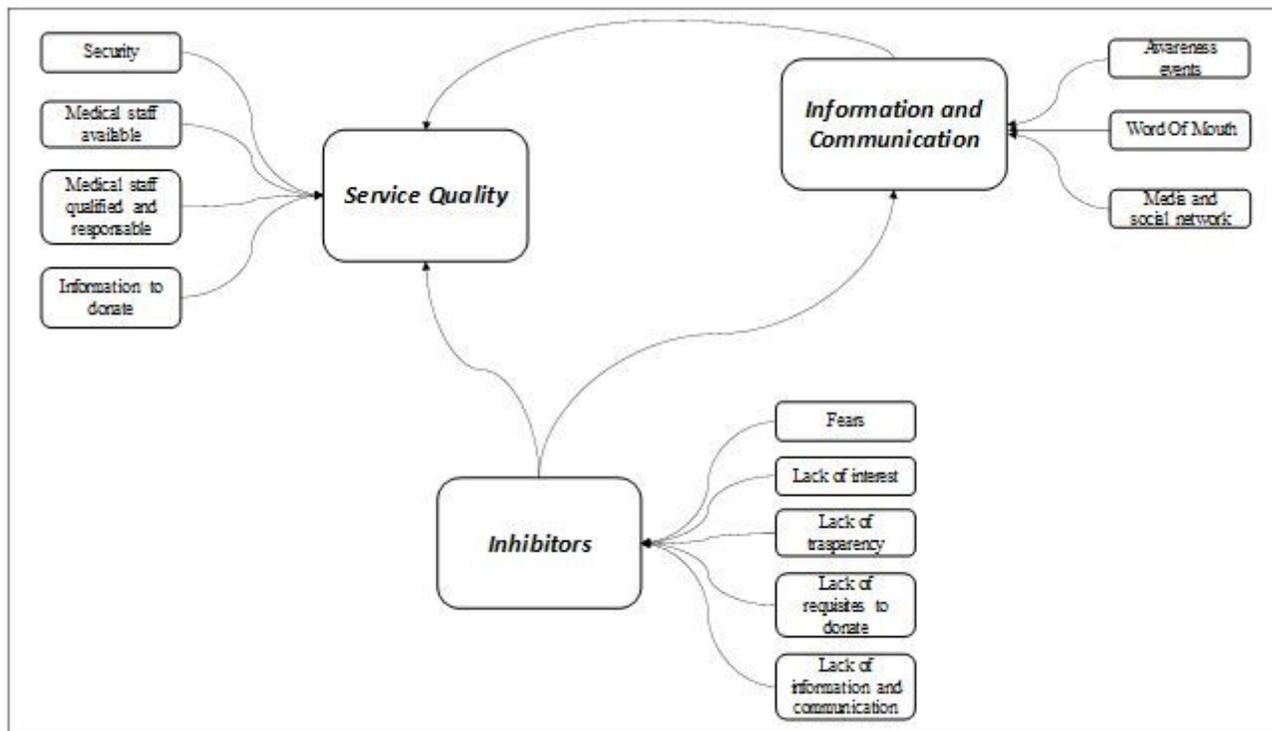


Figure 3

Non-donors, cognitive map

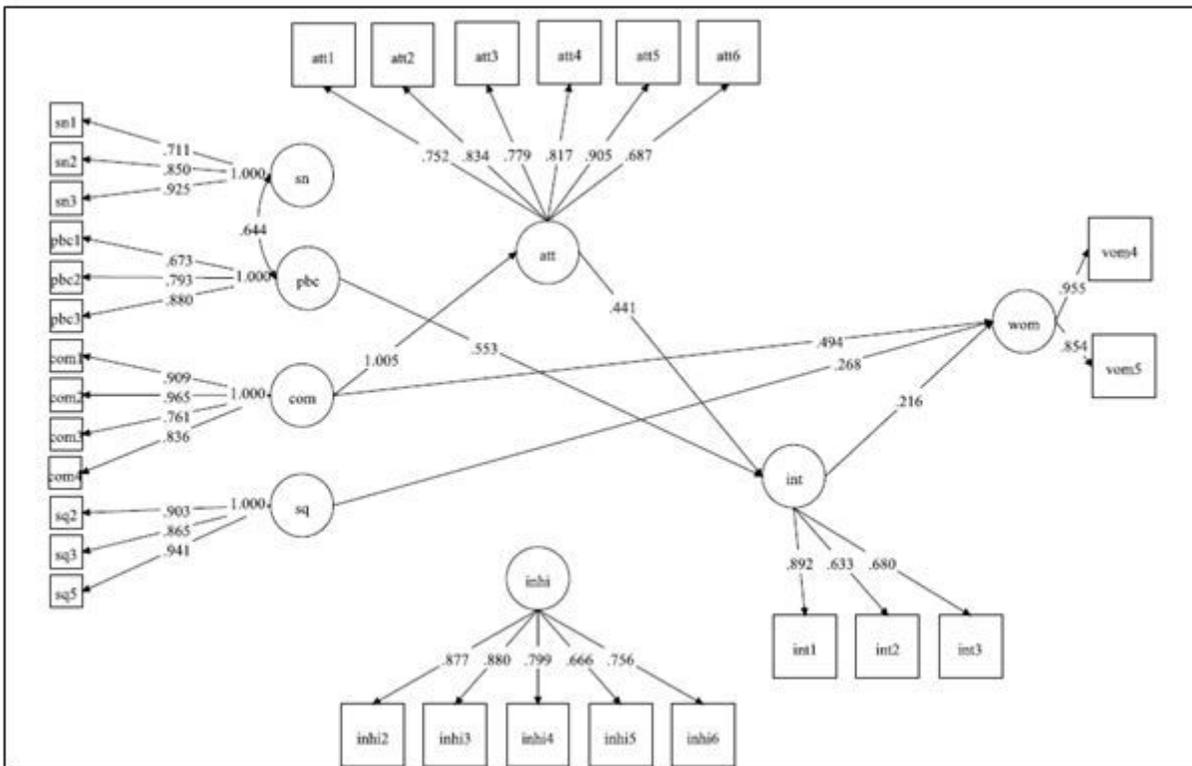


Figure 4

The conceptual model validated through SEM, Group A, donors

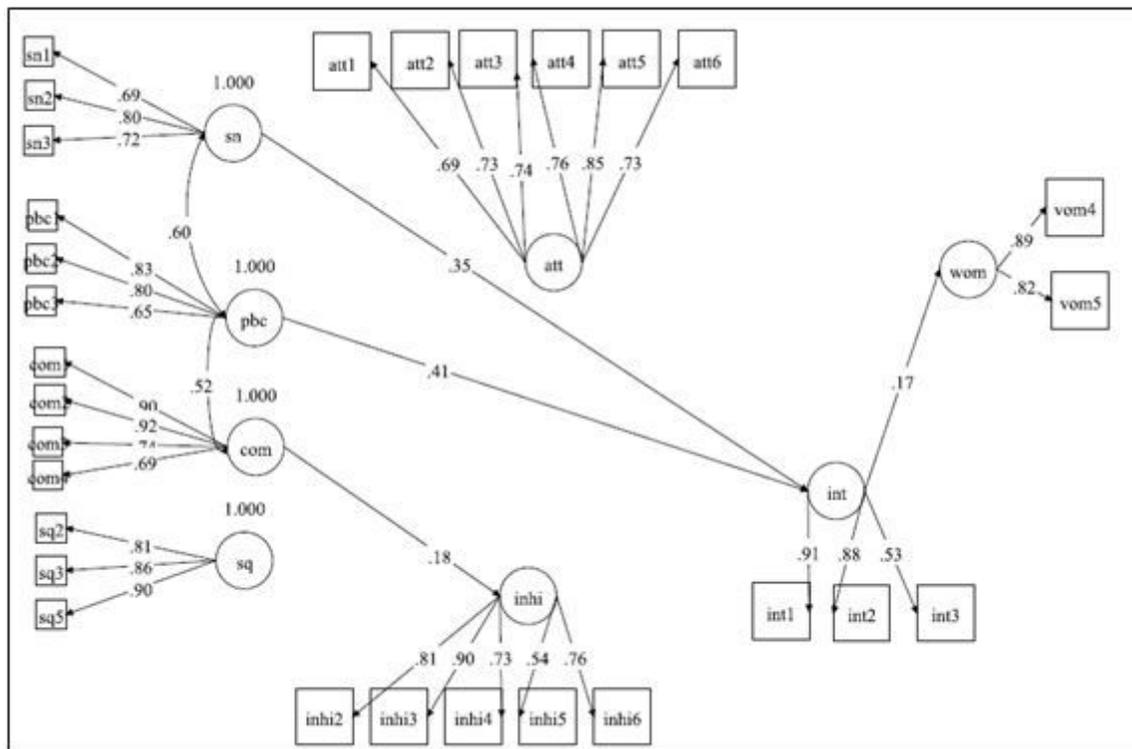


Figure 5

The conceptual model validated through SEM, Group B, non-donors

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [annex1Questionnairestructure.docx](#)