Promoting the propensity for blood donation through the understanding of its determinants.

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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 analyze 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 continues to be a primary need for 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.

**Methods.** The purpose of this paper is to understand the main antecedents of citizens’ blood donation intention and the propensity to encourage communication about blood donation 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 Modelling, 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 recommend and communicate the value of blood donation.

**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]. National governments must raise awareness of the phenomenon of blood donation by ensuring access to sufficient and safe blood. 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 contribute to human well-being [70] positively. 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 continuously 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 Greinacher et al., all these aspects could
generate a dangerous shortage of available blood [6]. 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 [70,71,72].

In the Italian healthcare sector, blood donation is a complex process in which several public and private
stakeholders are involved, including public hospitals, donation associations, private foundations and
citizens. Italian government states that blood donation is an unpaid activity for the engaged donors,
which can only be compensated with low-cost services, small tokens, refreshments such as free breakfast
or a discount voucher for theatres and cinemas. For this reason, legal action may be taken against
anyone who donates blood for money (Art. 22, Law 219/2005). Hence the donation is considered as a
free, conscious and non-profit activity, carried out by voluntary non-remunerated blood donors (VNRD).
The Italian Blood Volunteers Association (AVIS) have defined ethical requirements for being and
becoming donors. To become a donor, it is necessary to be between 18 and 65 years old, weigh at least
50kg, and present a doctor's certification. Every year a donor can donate up to 4 times for men and two
times for women in the childbearing age, with a minimum interval of ninety days (Ministerial Decree
25/1/01). The maximum blood which can be donated at one time is 450 ml ± 10%. It is estimated that 40
units of blood are needed per year for every 1,000 people, that is about 2 400 000 units only for Italy. In
2019 in Italy there were 1,683,470 blood donors and among these 213,422 were donors in the younger
group (18-25 years) and the new donors were just over 362 thousand, down by 2.3% [71].

The real problem is that there is a lack of donors compared to the actual needs. Therefore, it is a priority 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. On this strength, the primary purpose of
this study is to understand the main determinants of citizens' intention to donate blood and their
propensity to encourage word of mouth about blood donation, to identify similarities and differences
between donors and non-donors.
To achieve this goal, we developed an empirical study in Italy. We adopted the Theory of Planned Behavior (TPB) lens to provide a complete picture of the determinants of blood donors' intention. Indeed, the TPB is recognized as the model for predicting and understanding health-related behavioural intentions and has had growing application within blood donation research [12,13,14,15]. The adoption of this theoretical lens contributes to the advance of academic theory and managerial implications in this field. We integrated the TPB with further relevant variables and, at the same time, 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. 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 multi-group structural equation model (SEM).

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

Main Document

2. Literature review and research hypotheses

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 analyze the main antecedents of citizens' behavioural intention. The Theory of Planned Behaviour [11] has been primarily used to analyze 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 analyze 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 to increase its predictive power [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].

In light of the presented review, the TPB was adopted as the primary lens of our model to understand the determinants of blood donation, and the following hypotheses were posited:

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

H2: *Subjective Norm* has a positive effect on *Intention*.

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

In literature, several authors call for a more in-depth and wider investigation to identify the elements that can motivate the citizens', pushing them toward the blood donation [8,22]. For instance, some authors [21,35] have investigated the influence of donation knowledge on the intention to donate. It emerged that it is essential to create awareness around the donation, enhancing the dissemination of right and transparent information throughout an accurate communication. For instance, Williams et al. [29] suggested that developing "messaging designed to recognize and enhance an individual's autonomy in deciding to donate again may be a more effective retention strategy than simply encouraging donors to return" [22]. Often, the lack of information on donating blood emerges as a reason for not donating [78]. WHO [9] states the role of communication is crucial to obtain the first donation and to encourage first-time donors to return for repeat donations, as well as to generate a positive word of mouth (WOM). Indeed, communication is the core of a successful and sustainable blood donor program [9]. Effective communication strategies promote blood donation attitude [79]. For instance, the study conducted by Josefa et al. [80] highlights that the radiophone campaigns generate a change in the attitude to donate blood and then effective information and communication initiatives can encourage people to change their behaviour by removing real or perceived inhibitors [80,81,82,83]. Communication strategies such as advertising, public relations, promotional campaigns, social media can play a crucial role in overcoming and/or mitigating these inhibitors to recruit and/or retain donors.

Moreover, Abbasi et al. [10] pointed out that social networks may play a crucial role in disseminating information, educating citizens, and sharing blood donation requests. In that sense, the role of traditional
forms of communication should be strengthened by sharing information and experiences throughout individuals’ WOM and electronic WOM (e-WOM). Indeed, both WOM and e-WOM have a significant impact on consumer behaviour and decision making [39] and a more significant 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]. To understand the contribution of communication in fostering the blood donation, the following research hypotheses are formulated:

H4: Communication positively influences Attitude.

H5: Communication positively influences WOM.

H6: Communication affects Inhibitors.

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. 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].

Blood donation inhibitors are classified into physical risks (transmission of disease), psychological (fear), social (moral responsibility or religious aspects) also defined as internal inhibitors and lack of time, inconvenient schedule and location classified as external inhibitors [84,85]. However, the most recurrent inhibitors that influence the intention to donate blood are fear of needles or fainting, the transmission of infectious diseases, pain when drawing and unpleasant sensations related to the withdrawal (fainting, weakness, nausea) [8,86].

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. Thus, the following research hypothesis is formulated:

H7: Inhibitors negatively influence Intention.

Sueming et al. [5] noticed that existing donors play an essential role in informing and motivating new volunteers. Martín-Santana and Beerli-Palacio [87] and Gazibara et al. [88] tested that donor experience is a factor influencing intention to donate blood in the future and to recommend donating blood to friends and relatives. Indeed, a donor’s positive experience encourages to re-donate, and the donor is more likely to generate WOMs, therefore, to encourage and promote to donate blood [73]. On this base, we decided to test the relation between the Intention to blood donation and WOM positing the following hypothesis:

H8: Intention affects WOM.

Finally, this study identifies the role of service quality in the blood donation process identifying the key aspects of donor experience. It’s crucial to provide an optimal donation experience to promote and incentive blood donation [67,73]. An effective and efficient donation system must consider and monitor service quality [74, 75] to ensure donor loyalty
and satisfaction. In fact, if the donor has a bad experience generated by excessive waiting times to donate, impure structures, absence of support during and after the donation, medical staff unqualified [76] will decrease the satisfaction and loyalty of donors.

Anyway, there aren’t contributions that investigate the effects of service quality on the propensity to generate WOM in blood donation context and thus, we stated the following hypothesis to address this gap:

H9: Service Quality has a positive effect on WOM.

Starting from the above assumptions and theoretical background we highlighted that there is an extensive 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]. In particular, the study conducted by Bednall et al. [18] emphasizes 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. Similarly, there is a lack of research aimed to investigate the contribution of service quality in fostering blood donation.

On this strength, our study aims to understand the main antecedents of citizens’ intention to donate and the propensity to generate WOM, namely the propensity to recommend and communicate the value of blood donation, and to compare these factors between donors and non-donors. We proposed a conceptual model grounded on the TPB model [11] and including other relevant variables for the blood donation, as well as communication, inhibitors, service quality and WOM. Figure 1 illustrates the hypotheses in the conceptual model.

3. Methodology

An empirical study was conducted in Italy to understand better 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), while the quantitative survey sample was composed of donors (N=173) and non-donors (N=87).
3.1 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 semi-structured in-depth interviews was to explore and analyze the strengths and weaknesses of the blood donation phenomenon and to compare them across both groups. Accordingly, the interview was carried out following two semi-structured topic guides one for the donors and one for the non-donor. Both the semi-structured interviews were composed of 7 guiding questions chosen a priori to facilitate discussion and maintain consistency [94], allowing respondents to express themselves naturally. Additional aspects were explored when raised by the respondents [94]. The semi-structured in-depth interview guides (Appendix I) were structured as follows: first, general questions on the phenomenon were posed to both groups, and then, some customized questions were posed based on the "status" of the respondent (donors/non-donors). In the case of the donors, the motivations for, the 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' sample was 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-donors were selected through a snowball approach [77]. In February 2018, by adopting the themes saturation criteria [94], 30 individuals underwent face-to-face in-depth interviews (15=donors; 15=no-donors). The interviews, approximately 30/40 min each, were audio-recorded, transcribed in verbatim and subjected to hermeneutical and content analysis on the basis of the process proposed by Glaser and Strauss [89]. Specifically, to analyze the qualitative data, we followed the four phases of content analysis: coding, categorizing, thematizing and integrating [90,91,92]. The MAXQDA18 software was adopted to manage and analyze the data and we followed a rigorous process to reduce any potential research bias. First, the collected qualitative data were coded in parallel by two researchers; a third researcher performed a second comparison of the two results. Finally, the discussion and the interpretation of the content analysis were jointly performed by the three researchers.

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 two questionnaires were structured in the same way, only three items slightly differ due to the specific status of donors and non-donors. Hence eight common dimensions were defined: Attitude, Subjective norm, Perceived behavioural control, Inhibitors and obstacles to donate, Information and Communication, Service quality, Intention, Word Of Mouth. Both questionnaires were composed of 29 items. A seven-point Likert scale was adopted to gather responses (1="completely disagree" to 7="completely agree"). The dimensions and items proposed in the questionnaires are shown in Table I.
Both questionnaires close with an open question, aimed at allowing participants to explain the main motivations behind their behaviour to donate/do not donate. These two open questions were analyzed by classifying and coding the motivations shared by the respondents.

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 convenience 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.

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" considers 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" assess 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" assess 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", namely the propensity to recommend and communicate the value of blood donation. The dimension assesses respondents' intention to recommend blood donation to friends and family face-to-face and on social media and social networks.

Firstly, the reliability and validity of the multi-item scales were verified according to the internal consistency (Cronbach's alpha) and the convergent validity through Average Variance Extracted (AVE) and Composite Reliability (CR) [52,55].

Then, the data analysis was carried out using the SPSS IBM 17.0 and Mplus 7 software packages [49]. Structural equation modelling (SEM) was used to verify the relations and test the conceptual model [50].
In particular, the multi-group SEM allows to simultaneously test the same model on multiple independent samples, based on the possession of a specific characteristic (donors, non-donors) [95].

4. Results

This section presents the results of the qualitative survey (4.1) and the quantitative survey (4.2).

4.1 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.

As shown in Appendix II, the sample of donor interviewees is composed of 7 males and eight females and the age range is balanced as follows: <25 (2); 26-35 (7); 37-50 (6). The majority of interviewees are regular donors (9), they donate 3-4 times a year. While the non-donors interviewed are ve males and ten females. The highest number of non-donors is found in the age groups <25 (6) and 26-35 (7).

During the analysis, the divergences of subjective interpretation and codification were discussed or reanalyzed to solve the conflicting view [93] and the results were compared to identify 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 (Figure 2, 3) and a table explaining donation meaning and motivations (Table II).

The maps showed the 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. In particular, the donor respondents take into account waiting times to donate, the cleanliness of transfusion centres and the availability and professionalism of the medical staff (Figure 2) (i.e. "When I donate I pay attention to whether medical staff are friendly and qualified, polite treatment and to tangible aspects such as the cleanliness of the facilities"). 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 (i.e. "The transfusion centres must guarantee the easy access to the donation centre and the easy-to-find information about places and times. Transfusion centres must also be safe and therefore guarantee hygiene and staff qualified").

Indeed, the qualitative analysis shows that 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 characteristics that inhibit donation (e.g., low blood pressure and abnormal blood levels), (i.e. "I can't donate due to my health condition." "The sight of blood is unpleasant and I’m afraid of needles and of infectious disease transmission"), 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. (i.e. “It is necessary to meet young people and take initiatives in schools and universities to sensitize them to blood donation”). 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. (i.e. “In small towns, people are not informed about the importance of donation. Donation initiatives are not advertised. Information is often not provided on the places, days and times to donate.”). Both donors and non-donors suggested promoting communication-related to blood donation events by not only using traditional WOM but also using advertising campaigns on social networks (e-WOM) and educational events in schools and universities. (i.e. “More communication and involvement in donation are needed. Social media platformer should be used to receive and transmit information on blood donation campaigns and requests.”. “Given the lack of blood, the advertising campaign should be increased, especially in the summer, given the low number of donors.”).

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, the 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). Also, 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). Also, the non-donors perceive donors as courageous (3) and religious (2).

Table II. Qualitative results: frequency of recurrent key issues for donors and non-donors.

### 4.2 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.

#### 4.2.1 Sample description

An overview of the sample characteristics is shown in Table III.

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%) of donors. A total of 57.2% of donors are civil servants, and 24.3% are students.

Regarding the donation career of respondents emerged that:
-33 donors (10 males, 23 females) donate occasionally once a year;

-53 respondents (12 males, 41 females) donate blood two times a year;

-38 respondents (28 males, ten females) donate three times a year;

-49 donors (37 males, 12 females) are regular donors (4 times a year).

The non-donors sample included 87 respondents, of which 65.5% were females, and 34.5% were males. The majority of the non-donor 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 quantitative samples.

The distribution of the respondents across Italian regions (Appendix III) shows that the significant number of respondents are Veneto (25.4%), Piedmont (17.9), Lazio (17.9%) and Puglia (11.6).

Concerning the motivations behind the donation, from the analysis of the open questions, it emerged that the main aspects enticing donors to donate are: personal choice and beliefs (37%), educational activities (17%), to have accompanied relatives and friends to donate (13%), and sensitive campaigns (13%) (Table IV a). While the favourite locations for donating seems to be schools and universities (45%) and ad hoc areas in the city centre (24%). For non-donors, the primary aspect that may encourage them to start donation dating is the needs of blood from friends and family members (54%) followed by sensitive companies (21%) (Table IV b).

**Table IV.** Quantitative results: frequency of donor's motivations to blood donation and a favourite location for donating (a) and frequency of motivations that could push Non-Donors to donate and favourite location to start donating (b)

### 4.2.2 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). 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, reliability and validity were calculated using the same measures. As shown in Table V, the data meet the criteria for acceptable reliability and validity [52-54].

**Table V.** Constructs reliability and validity: Cronbach's alpha, Average Variance Extracted (AVE) and Composite Reliability (CR) for Donors (Group A) and Non-donors (Group B).

### 4.2.3 Structural Equation Models: a multi-group analysis
The conceptual model was tested with SEM using *Mplus* 7 software [49].

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 the multi-group analysis to identify the main differences between the two independent samples simultaneously. The invariance between the two samples was tested by using multi-group SEM. The baseline model was fitted to the data on both groups simultaneously, $\chi^2$ (df = 715) = 1.326.504, p < .01, CFI = .903, RMSEA = .080 (95% CI = 0.074 0.088), SRMR = .065, supporting the configural invariance hypothesis. Then, constraining the loadings between the groups yielded a nonsignificant increase of the CFI ($\Delta$CFI = .003), providing support for metric invariance. Moreover, constraining the intercepts between the groups, we observed a small decrease in the CFI: ($\Delta$CFI = .003). The model is assumed to be non-invariant if the decrease in CFI is larger than 0.002 [96] compared to the baseline model. We have not considered the difference between the chi-square of nested models considering the strong dependence of the chi-square on the sample size [97]. Thus, the hypothesis of scalar invariance can be accepted.

Hence, a graphical representation of the model is proposed. The robust estimator MLMV was used for continuous variables to correct covariance. Table VI shows the results of the goodness-of-fit parameters. Then, a graphical representation of the measurement models is proposed for both groups.

The results of the SEM goodness-of-fit parameters are presented below (Table VI):

- **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 VI.** Goodness-of-fit index model for Donors (Group A) and Non-donors (Group B).

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. The graphical representation of the model is shown for both groups: donors (Figure 4) and non-donors (Figure 5), including only the significant relations between factors (p<0.05).

The observed model of Group A shows that there is the covariance between Subjective Norm and Perceived Behavioural Control ($\beta$=0.644), as in the model previously tested by Ajzen [11].
The observed model of Group B shows that there is the covariance between Subjective Norm and Perceived Behavioural Control ($\beta=0.603$), as in the model previously tested by Ajzen [11], as well as between Perceived Behavioural Control and Communication ($\beta=0.524$).

The results of the two groups are summarized in Tables VII. It is possible to notice that the indicators have significant loadings on their assigned constructs. The residual variances are reported in Appendix IV.

**Table VII.** Factor loadings statistics, Donors (Group A) and Non-donors (Group B).

The main results and the status of the research hypotheses for both groups are summarized in Table VIII.

**Table VIII.** Status of research hypotheses for Donors (Group A) and Non-donors (Group B).

Regarding the donors, all the proposed hypotheses are supported (p-value <0.005), except for H2, H6 and H7. The observed model in Group A (donors) shows that Attitude ($\beta=0.441$) and Perceived Behavioural Control ($\beta=0.553$) directly and positively influence Intention (H1, H3). Communication has a strong impact on Attitude ($\beta=1.005$) and on Propensity to Generate WOM ($\beta=0.494$) (H4, H5). Propensity to Generate WOM is predicted by Intention ($\beta=0.216$), Service Quality ($\beta=0.268$) and Communication ($\beta=0.494$) (H8, H9, H5). However, Subjective Norm ($\beta=-0.031$) and Inhibitors ($\beta=-0.025$) do not significantly affect Intention to donate (H2, H7), and Communication ($\beta=-0.066$) 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 ($\beta=0.271$).

Regarding the non-donors, all the proposed hypotheses are supported (p-value <0.05), except H1 and H7. In particular, the results reveal that Subjective Norms ($\beta=0.346$), Perceived Behavioural Control ($\beta=0.410$) and Attitude ($\beta=0.052$) affect Intention to donate (H2, H3, H1). Concerning the construct Attitude, its p-value can be considered marginally significant (p-value=0.054), and for the principle of conservation, we decided to accept H1. Communication positively influences Attitude ($\beta=1.000$) and Inhibitors ($\beta=0.183$) (H4, H6). Communication ($\beta=0.505$), Intention ($\beta=0.174$) and Service Quality ($\beta=0.209$) affect Propensity to Generate WOM (H5, H8, H9). However, Inhibitors ($\beta=-0.039$) does not affect Intention to donate (p-value=0.493) (H7). In particular, Inhibitors is not a significant antecedent of Intention to donate among non-donor respondents.

Summarizing, the results related to the donor group 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.

While, the case of non-donor Attitude, Subjective norm and Perceived Behavioural Control directly influence Intention to donate (for the first time). Even among non-donors, Information and Communication predict both Attitude and Inhibitors. Regarding Propensity to generate WOM, there are three main predictors: Intention, Service Quality and Communication. 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.

5. Discussion And Findings

The present paper proposes a conceptual model grounded on the literature and aimed to study the main determinants of the donation intention and the propensity to empower the donation WOM. Throughout the adoption of the mixed-method approach, qualitative and quantitative research was integrated to verify the model on two different groups: donors and non-donors.

The qualitative step of the research confirms the existence of multiple dimensions affecting the decision to donate for both groups, highlighting the importance to propose more complex model respect to the TPB [11] including further variables as suggested by other authors [8, 22]. More specifically, the qualitative results confirm the importance of service quality to repeat and promote the donation [67,83]. Similarly, the qualitative analysis corroborates the presence of a long list of perceived inhibitors that hamper the donation, as well as identified in the literature analysis [e.i. 36,37,38,74,75,80,82,84,85]. Finally, it seems to emphasize the central role played by the information and communication processes in fostering both the retention and promotion of blood donation [e.i. 9,22,40,41,79]. These qualitative findings were used as input for the development of the quantitative questionnaires aimed to test the proposed conceptual model. Indeed, the model was simultaneously tested on two independent samples of donors and non-donors, and the results are very interesting. 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.

It is worth emphasizing that 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. Attitude towards blood donation assesses whether a respondent believes that this activity is ethical, safe, useful and a citizens’ moral and social obligation. Subjective norm assesses beliefs about whether significant other people approve of and appreciate the behaviour of blood donation. Perceived Behavioural Control sets 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. Intention assesses the willingness to donate again (donors) or for the first time (non-donors). Propensity to Generate WOM considers one’s recommendation to donate blood among friends and family using social networks.

These findings are aligned with previous studies that have implemented the TPB model for blood donation [15,19]. Nevertheless, some new constructs were included in the present study to fill the gaps in knowledge identified in the literature review [e.i. 8, 22].
The present study, indeed, suggests that *Service Quality* is an essential dimension for both donors and non-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 to 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. This is aligned with the hypothesis of Pagliariccio and Marinozzi [62] concerning the positive influence of donation satisfaction on the behaviour to donate again.

In addition, our findings recognize 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 recruitment campaigns mainly on social networks and through promoting educational activities in schools and universities. Communication should promote donations mostly 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. 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.

Finally, *Inhibitors* were not a significant predictor of intention in either group. 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). People who are affected by inhibitors are more difficult to recruit and sensitize. 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. Even if they are not donors (for instance for lack of requirements or fear), they may promote the importance of donating blood within their networks, in particular among those friends that have the specific features to become donors and, at the same time, are not influenced by inhibitors.

**Conclusion**

6.1 *Originality and managerial implications*

From an academic viewpoint, the originality of our study stands on the analysis of the blood donation phenomenon to understand the antecedents of citizens' intention to donate and their propensity to recommend and communicate the value of blood donation. In addition, the research proposes a combined analysis of two different groups: donors and non-donors.

Our findings show that there are differences and similarities in the antecedents of blood donation among donor and non-donor groups. The study confirms the appropriateness of the TPB in analysing the blood donations phenomenon, introducing further relevant dimensions that have an important role as a
determinant to donate and promote a positive WOM towards the donation. These dimensions are Attitude, Perceived Behavioural Control, Information and Communication, Service quality, Intention and WOM.

In addition, 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 policymakers 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 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. The meso level is represented by companies, healthcare organizations, schools and universities. 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 promote blood donation indirectly. 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.

Also, the global pandemic has reaffirmed both the needs of available blood by increasing the number of donors and the pivotal urgency to guarantee a safer environment for donating. 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 [71,72]. Thus, even in this state of emergency that hospitals currently have to deal with, donations cannot be ceased.

For instance, in the first week of March 2020, due to the pandemic, donations fell by 10% across Italy. Some Italian foundations such as CIVIS (AVIS, CRI, FIDAS and FRATRES) and CNS (National Blood Center) have launched an invitation to donate and tempered the donors' anxiety about contagion. 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 [70,71,72].
6.2 Limitations and future perspectives

Despite the importance of the main findings of this study, some limitations exist and should be overcome by future studies. First, the present research was carried out before the COVID-19 pandemic. It could be interesting to repeat the analysis to investigate how and why the pandemic has affected the donation phenomenon, influencing the propensity and promotion of blood donation.

Second, even if the donors and non-donors samples size are consistent with the explorative nature of the proposed study, in future research, they may be enlarged to confirm and enrich the proposed findings. Indeed, 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 based on 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.

Abbreviations

SEM= Structural Equation Modelling
SDT=Self-determination Theory
TPB= Theory of Planned Behaviour
WOM = Word Of Mouth; e-WOM=electronic WOM
WHO= Word Health Organization

Declarations

Ethics approval and consent to participate

Ethics approval unnecessary according to national regulations

However, this study respects ethical issue and policy specifically considering the privacy and professional secret. Values as the human respect of life, freethinking and the international patients’ rights were observed for the data collection phase.

(see: https://www.garanteprivacy.it/web/guest/home/docweb/-/docwebdisplay/docweb/385378)

The authors confirm that the consent obtained from study participants was written directly in the survey model were they accepted to participate in the survey, aware of the fact that their anonymity was guaranteed.
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 did not have previously been published elsewhere.

The datasets generated and/or analyzed during the current study are not publicly available due because they are related to patients but are available from the corresponding author on request.

Competing interests

The authors declare that there are no financial and non-financial competing interests.

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No funding was obtained for this study.

Authors' contributions

RGM had the original idea for the study and designed the quantitative research. LDP designed and collected data for the qualitative study. RGM and MGP analyzed the quantitative data, LDP and MGP analyzed the qualitative data. All authors contributed to the 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 for Donor and Non-Donors (in brackets the item's text adapted for Non-Donors group)
| Dimension          | Item                                                                 | Code  | References |
|-------------------|----------------------------------------------------------------------|-------|------------|
| **Attitude**      | I think that donating blood is ethical.                              | ATT_1 | [11]       |
|                   | I think that donating blood is useful.                               | ATT_2 |
|                   | I think that donating blood is safe.                                 | ATT_3 |
|                   | I think that donating blood is a moral obligation.                   | ATT_4 |
|                   | Donating blood is important to me.                                   | ATT_5 |
|                   | I think that donating blood is a personal responsibility.            | ATT_6 |
| **Subjective norm** | Most people that are important to me appreciate that I am a donor. | SN_1  | [11]       |
|                   | [most people that are important to me would appreciate if I became a |       |            |
|                   | donor]                                                               |       |            |
|                   | Most people that are important to me think that I should donate blood. | SN_2  |
|                   | Most people that are important to me appreciate the donation activity. | SN_3  |
| **Perceived behavioural control** | It is easy to possess the requisites to donate. | PBC_1 | [11]       |
|                   | People who have a regular life are more likely to be blood donors.   | PBC_2 |
|                   | If I decide to donate in the next weeks, I could do it without difficulty. | PBC_3 |
| **Inhibitors**    | Fear of needles.                                                     | INHI_2 | [16]       |
|                   | Pain when drawing.                                                   | INHI_3 |
|                   | Sight of blood.                                                      | INHI_4 |
|                   | Unpleasant sensations related to the withdrawal (fainting, weakness, nausea). | INHI_5 |
|                   | Withdrawal preparation (compliance with requirements).               | INHI_6 |
| **Information and communication** | It is necessary to increase donation awareness activities. | COM_1 | Qualitative phase |
|                   | It is necessary to make young people aware of donation through activities in schools and universities. | COM_2 |
|                   | It is necessary to increase donation awareness through social media and social networking. | COM_3 |
|                   | It is necessary to introduce promotional campaigns through web and social networks | COM_4 |
| **Service quality** | The medical staff should be kind.                                    | SQ_2  | [32,66,67] |
|                   | The medical staff should be competent.                               | SQ_3  |
|                   | The medical staff should support me during and after the donation.   | SQ_5  |
| **Intention**     | I would like to donate blood again                                    | INT_1 | [11,16]    |
|                   | [I would like to become a donor]                                     |       |            |
|                   | I would like to donate blood more often                               | INT_2 |
|                   | [I will donate blood for the first time]                             |       |            |
|                   | I would like to donate blood even without receiving benefits (e.g., discounts, economic benefits). | INT_3 |
| **WOM**           | I would recommend blood donation to my friends and family.           | WOM_1 | [11,16]    |
|                   | I would recommend blood donation on social networks.                 | WOM_2 |

**Table II.** Qualitative results: frequency of recurrent key issues for donors and non-donors.
Donors

| The donation is...       | Frequency | Non-donors
|--------------------------|-----------|--------------------------
| ...a personal responsibility | 11        | ...a personal responsibility | 10  |
| ...a form of altruism    | 9         | ...a form of altruism    | 9   |
| ...a moral obligation    | 6         | ...a moral obligation    | 3   |

The donor is a person...

| The donor is a person...       | Frequency | The donor is a person... | Frequency |
|--------------------------|-----------|--------------------------|-----------|
| ...with a healthy lifestyle | 7         | ...with a healthy lifestyle | 6         |
| ...altruistic             | 6         | ...fear                  | 13        |
| ...responsible            | 2         | ...altruistic            | 4         |
| ...courageous             |           | ...responsible           | 3         |

Motivations to donate

| Motivations to donate | Frequency | Motivations not to donate | Frequency |
|-----------------------|-----------|---------------------------|-----------|
| personal values       | 7         | Fear                      | 8         |
| to help friends/family members | 6 | Requisites to donate | 3 |
| external influences   | 2         | Transparency              | 2         |

Table III. Demographic characteristics of the quantitative samples.

| Demographic characteristics | Sample's specifics | Donors (N=173) | Non-donors (N=87) |
|-----------------------------|--------------------|----------------|-------------------|
|                             | Frequency | Percentage | Frequency | Percentage |
| Gender                      |          |           |          |           |
| Male                        | 87       | 50.3%     | 30       | 34.5%     |
| Female                      | 86       | 49.7%     | 57       | 65.5%     |
| Age                         |          |           |          |           |
| 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%      |
| Educational level           |          |           |          |           |
| 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%      |
| Job                         |          |           |          |           |
| 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. Quantitative results: frequency of donor's motivations to blood donation and a favourite location for donating (a) and frequency of motivations that could push Non-Donors to donate and favourite location to start donating (b)
### DONORS (a)

| Motivation for first donation       | Frequency | %  | Favourite location for donating blood | Frequency | %  |
|-------------------------------------|-----------|----|--------------------------------------|-----------|----|
| Individual choice                   | 64        | 37%| School/universities                   | 77        | 45%|
| Educational initiatives             | 29        | 17%| City centre areas (plaza or parks)    | 42        | 24%|
| Accompanying relatives/friends      | 23        | 13%| In the office                         | 24        | 14%|
| Sensitive campaign                  | 23        | 13%| Sport centre                          | 12        | 7% |
| Blood need for relatives/friends    | 14        | 8% | Hospitals                             | 7         | 4% |  |
| Being a parent of a donor           | 8         | 5% | Blood donation centre                | 2         | 1% |
| Altruism                            | 6         | 3% | Churches                              | 2         | 1% |
| Being a friend of a donor           | 2         | 1% | Everywhere                            | 2         | 1% |
| Free breakfast                      | 1         | 1% | Place with parking                    | 2         | 1% |
| Familiar education                  | 1         | 1% | Associations                          | 1         | 1% |
| Personal motivation                 | 1         | 1% | Mall                                  | 1         | 1% |
| Personal satisfaction               | 1         | 1% | Game rooms                            | 1         | 1% |

### NON-DONORS (b)

| Motivations for starting the donation | Frequency | %  | Favourite location to start donating | Frequency | %  |
|--------------------------------------|-----------|----|--------------------------------------|-----------|----|
| My parents/friend need blood         | 47        | 54%| Doesn’t matter                        | 45        | 52%|
| Sensitive campaigns                  | 18        | 21%| Blood donation centre                | 34        | 39%|
| Supporting those who are in need     | 9         | 10%| Association centre                   | 5         | 6% |
| For ethical reasons                  | 6         | 7% | Mobile blood station                 | 3         | 3% |
| Educational event at school/university | 3       | 3%|                                       |           |    |
| Accompanying parents/friends         | 3         | 3%|                                       |           |    |
| Overcoming my fears                  | 1         | 1%|                                       |           |    |

### Table V.

Constructs reliability and validity: Cronbach’s alpha, Average Variance Extracted (AVE) and Composite Reliability (CR) for Donors (Group A) and Non-donors (Group B).

| Group A: DONORS Factor | Cronbach’s alpha | AVE | CR   | Group B: NON-DONORS Factor | Cronbach’s Alpha | AVE | CR   |
|------------------------|-----------------|-----|------|---------------------------|-----------------|-----|------|
| Attitude               | 0.910           | 0.638| 0.913| Attitude                      | 0.880           | 0.562| 0.884|
| Subjective norm        | 0.872           | 0.695| 0.871| Subjective norm              | 0.804           | 0.547| 0.783|
| Perceived behavioural control | 0.842 | 0.619| 0.828| Perceived behavioural control | 0.750 | 0.584| 0.806|
| Inhibitors             | 0.897           | 0.639| 0.898| Inhibitors                   | 0.840           | 0.575| 0.868|
| Information and Communication | 0.941 | 0.759| 0.926| Information and Communication | 0.900          | 0.671| 0.889|
| Service Quality        | 0.934           | 0.816| 0.930| Service Quality              | 0.900           | 0.734| 0.892|
| Intention              | 0.777           | 0.553| 0.784| Intention                    | 0.753           | 0.625| 0.826|
| WOM                    | 0.891           | 0.821| 0.901| WOM                          | 0.841           | 0.731| 0.844|
### Table VI. Goodness-of-fit index model for Donors (Group A) and Non-donors (Group B).

| Goodness-of-fit index                        | Observed value | Commonly used threshold |
|----------------------------------------------|----------------|-------------------------|
| $X^2$ (Chi-squared)                          | 934.259*       | [58,59,60,61]           |
| degrees of freedom                           | 760            |                         |
| p-value                                       | 0.000          |                         |
| $X^2$ (Chi-squared) contribution group A      | 481.191        | [68]                    |
| $X^2$ (Chi-squared) contribution group B      | 453.068        |                         |
| SRMR (Standardized root mean square residual) | 0.074          | <0.08 [60]              |
| CFI (Comparative fit index)                  | 0.907          | ≥ 0.90 [57]             |
| TLI (Tucker-Lewis index)                     | 0.901          | ≥ 0.90 [58]             |
| RMSEA                                        | 0.042          | < 0.05: minimal error   |
| Root mean square error of approximation      |                | 0.05 ≤ RMSEA ≤ 0.08 acceptable |
| 90% C.I. = (0.032-0.051)                      |                | 0.08 rejectable model   |
| WRMR (Weighted root mean square residual)    | 0.985          | < 1 [69]                |

### Table VII. Factor loadings statistics, Donors (Group A) and Non-donors (Group B).
| Constructs                             | Group A: DONORS | Group B: NON-DONORS |
|---------------------------------------|-----------------|---------------------|
|                                       | Code | Standardized loading | Measurement error variance | P-value | Code | Standardized loading | Measurement error variance | P-value |
| Attitude                              | ATT_1 | 0.752 | 0.048 | 0.000 | ATT_1 | 0.668 | 0.036 | 0.000 |
|                                       | ATT_2 | 0.834 | 0.035 | 0.000 | ATT_2 | 0.730 | 0.032 | 0.000 |
|                                       | ATT_3 | 0.779 | 0.045 | 0.000 | ATT_3 | 0.742 | 0.033 | 0.000 |
|                                       | ATT_4 | 0.817 | 0.038 | 0.000 | ATT_4 | 0.764 | 0.038 | 0.000 |
|                                       | ATT_5 | 0.905 | 0.023 | 0.000 | ATT_5 | 0.851 | 0.024 | 0.000 |
|                                       | ATT_6 | 0.687 | 0.043 | 0.000 | ATT_6 | 0.729 | 0.032 | 0.000 |
| Subjective Norm                       | SN_1 | 0.711 | 0.041 | 0.000 | SN_1 | 0.688 | 0.039 | 0.000 |
|                                       | SN_2 | 0.850 | 0.036 | 0.000 | SN_2 | 0.804 | 0.041 | 0.000 |
|                                       | SN_3 | 0.925 | 0.018 | 0.000 | SN_3 | 0.722 | 0.039 | 0.000 |
| Perceived Behavioural Control         | PBC_1 | 0.673 | 0.043 | 0.000 | PBC_1 | 0.827 | 0.028 | 0.000 |
|                                       | PBC_2 | 0.793 | 0.032 | 0.000 | PBC_2 | 0.801 | 0.036 | 0.000 |
|                                       | PBC_3 | 0.880 | 0.030 | 0.000 | PBC_3 | 0.652 | 0.034 | 0.000 |
| Inhibitors                            | INHI_1 | 0.877 | 0.025 | 0.000 | INHI_1 | 0.813 | 0.034 | 0.000 |
|                                       | INHI_2 | 0.880 | 0.024 | 0.000 | INHI_2 | 0.898 | 0.023 | 0.000 |
|                                       | INHI_3 | 0.799 | 0.028 | 0.000 | INHI_3 | 0.731 | 0.034 | 0.000 |
|                                       | INHI_4 | 0.666 | 0.045 | 0.000 | INHI_4 | 0.543 | 0.045 | 0.000 |
|                                       | INHI_5 | 0.756 | 0.032 | 0.000 | INHI_5 | 0.759 | 0.039 | 0.000 |
| Information and Communication         | COM_1 | 0.909 | 0.019 | 0.000 | COM_1 | 0.900 | 0.022 | 0.000 |
|                                       | COM_2 | 0.965 | 0.011 | 0.000 | COM_2 | 0.922 | 0.020 | 0.000 |
|                                       | COM_3 | 0.761 | 0.035 | 0.000 | COM_3 | 0.736 | 0.041 | 0.000 |
|                                       | COM_4 | 0.836 | 0.030 | 0.000 | COM_4 | 0.694 | 0.040 | 0.000 |
| Service Quality                       | SQ_1 | 0.903 | 0.019 | 0.000 | SQ_1 | 0.807 | 0.028 | 0.000 |
|                                       | SQ_2 | 0.865 | 0.041 | 0.000 | SQ_2 | 0.860 | 0.021 | 0.000 |
|                                       | SQ_3 | 0.941 | 0.016 | 0.000 | SQ_3 | 0.901 | 0.023 | 0.000 |
| Intention                             | INT_1 | 0.892 | 0.026 | 0.000 | INT_1 | 0.905 | 0.028 | 0.000 |
|                                       | INT_2 | 0.633 | 0.046 | 0.000 | INT_2 | 0.883 | 0.018 | 0.000 |
|                                       | INT_3 | 0.680 | 0.071 | 0.000 | INT_3 | 0.526 | 0.041 | 0.000 |
| WOM                                   | WOM_1 | 0.955 | 0.015 | 0.000 | WOM_1 | 0.885 | 0.032 | 0.000 |
|                                       | WOM_2 | 0.854 | 0.041 | 0.000 | WOM_2 | 0.824 | 0.028 | 0.000 |

**Table VIII.** Status of research hypotheses for Donors (Group A) and Non-donors (Group B).
| Hypothesis | Predictor       | Dependent variable | Estimate | S.E. | Two-tailed p-value | Supported |
|------------|----------------|-------------------|----------|-----|--------------------|-----------|
| **Group A DONORS** |                |                   |          |     |                    |           |
| H1         | Attitude       | Intention         | 0.441    | 0.136 | 0.001              | Yes       |
| H2         | Subjective Norm| Intention         | -0.031   | 0.083 | 0.705              | No        |
| H3         | Perceived Behavioural Control | Intention | 0.553    | 0.121 | 0.000              | Yes       |
| H4         | Communication  | Attitude          | 1.005    | 0.052 | 0.000              | Yes       |
| H5         | Communication  | WOM               | 0.494    | 0.076 | 0.000              | Yes       |
| H6         | Communication  | Inhibitors        | -0.066   | 0.060 | 0.271              | No        |
| H7         | Inhibitors     | Intention         | -0.025   | 0.039 | 0.517              | No        |
| H8         | Intention      | WOM               | 0.216    | 0.069 | 0.002              | Yes       |
| H9         | Service Quality| WOM               | 0.268    | 0.079 | 0.001              | Yes       |
| **Group B NON-DONORS** |                |                   |          |     |                    |           |
| H1         | Attitude       | Intention         | 0.052    | 0.078 | 0.054              | Yes       |
| H2         | Subjective Norm| Intention         | 0.346    | 0.106 | 0.001              | Yes       |
| H3         | Perceived Behavioural Control | Intention | 0.410    | 0.081 | 0.000              | Yes       |
| H4         | Communication  | Attitude          | 1.000    | 0.097 | 0.000              | Yes       |
| H5         | Communication  | WOM               | 0.505    | 0.088 | 0.000              | Yes       |
| H6         | Communication  | Inhibitors        | 0.183    | 0.062 | 0.003              | Yes       |
| H7         | Inhibitors     | Intention         | -0.039   | 0.057 | 0.493              | No        |
| H8         | Intention      | WOM               | 0.174    | 0.066 | 0.009              | Yes       |
| H9         | Service Quality| WOM               | 0.209    | 0.107 | 0.052              | Yes       |