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Prosocial customer in the public sector: A PLS-SEM analysis applied to blood donation (active donors)

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ABSTRACT

The act of donating blood creates social and public value (as a transformative service), but donors do not always repeat, so this study analyses the antecedents of attitudinal loyalty in donors. In addition, this research identifies active donor profiles to design personalised strategies to increase customers' attitudinal loyalty. An online survey was conducted with 30,619 active donors who have donated blood at least once over the past two years. The study applies a quantitative modelling model called Partial Least Squares-Structural Equation Modelling (PLS-SEM). Analyses confirmed that motivations, obstacles and service quality influence satisfaction and donor attitudinal loyalty. Also, three active donor clusters were identified, as donation centres must adjust to each cluster to create value for society. This research contributes to understanding the factors that increase donor loyalty and closing a gap in the literature on prosocial consumer behaviour, and thereby other public services that depend upon the willingness of the individual. Furthermore, this approach enables the design of a more effective policy agenda and helps to focus public investment on developing strategies to engage willing and experienced donors.

1. Introduction

Consumer behaviour represents a line of ongoing interest in research literature, as evidenced by recent studies published on this topic, such as Huang and Sudhir [1]. The study of service quality and consumer satisfaction (i.e., Ref. [2]), which constitute evaluative variables of service [3], stands out. However, these antecedents may not explain consumer loyalty as one would expect, and therefore [4] mention the "inefficiency of customer satisfaction" when explaining that positive service evaluation does not guarantee customer loyalty. To bridge this gap, research on the antecedents of consumer loyalty has examined the influence of other potential factors (trust, brand image ...) (i.e., Refs. [3, 5]). Abu-alhaija et al. [6] point out that there is a gap in literature on the role of motivations in predicting future purchase behaviour. This gap becomes even wider in the study of obstacles to consumer behaviour (i.e., Ref. [7]).

In this background, the issue of consumer loyalty is of real concern in transformative services, such as blood donation services [8]. Based on Transformative Service Research (TSR) [9], blood donation would be a transformative service, as blood donation service is mainly intended to provide blood to the health system [8]. Consequently, blood donation ensures the sustainability of health care as a vital service for primary

public interest, as blood donation improves public healthcare (e.g., Ref. [10]). In this regard, there is an important concern for donation centres to increase the number of regular donors, since donors do not necessarily donate again [11]. Studies on the factors that ensure that the donor repeats are of growing interest in the literature (e.g., Refs. [12, 13]), due to their social and public value.

This research contributes to understanding the factors that increase donor loyalty and aims to close a gap in prosocial consumer behaviour literature, and thereby other public services that depend upon the willingness of the individual. In this regard, the literature shows a growing interest in donations as prosocial acts (i.e., Ref. [14]) and the antecedents of prosocial behaviour (e.g., Refs. [15,16]). For instance, Craig et al. [15] argue that prosocial behaviour cost management (such as, blood donation), in addition of the benefits, represents both an alternative tool for policy makers/managers and organizations and an area of future research of significant academic value. For instance, they explain that longer waits to donate would incite blood donor frustration, which leads to lower service quality perceptions and lessens the intention to donate. Thus, wait time would deter future donations and therefore hinders the transformative mission of blood donation centres, and therefore longer wait times would lead to substantial social costs. Lacetera et al. [16] demonstrate that economic incentives (such as, gift

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cards) positively influence the intention to donate blood. Nevertheless, as they have come to recognise, other motivators (such as social recognition) could also improve intention to donate. Consequently, it is worthwhile to simultaneously examine, within the same research model, the direct and indirect effects of both motivations and obstacles on the future behaviour of the experienced donor. This objective constitutes a scientific contribution of this research, since, to the best of our knowledge, there is an important gap on this issue. This research also sheds light on the public sector and non-profit management literature by identifying consumer profiles with the intent to design effective personalised strategies to increase consumer attitudinal loyalty. Based on Ferreira et al. [17], even in the healthcare field, marketing strategies may influence consumers' behaviour. Likewise, based on Service-Dominant Logic (SDL) [18], donors would be a critical factor in the donation service experience and, from TSR [9], an enabler of collective well-being. Understanding the donor consumer mindset will provide valuable insights to the pro-social SDL behaviour, while, in the past, SDL has mainly been applied to the study of for-profit organizations, as Frentz et al. [19] point out.

This article provides a holistic view by analysing how the donation process, motivations and obstacles influence donors who have already donated. It has been demonstrated that motivations and, above all, obstacles, continue to influence the donor after several donations. This helps direct public investment towards the development of effective strategies to increase the attitudinal loyalty of the experienced donor. Another contribution of this research is methodological, as it is based on actual donation behavioural data from a final sample of 30,619 active donors. According to Lacetera et al. [16] prosocial behaviour research requires a reliance on large samples, actual behaviour data or natural field experimental studies. This paper applies the Partial Least Squares-Structural Equation Modelling (PLS-SEM) quantitative model to describe donors' complex behaviour. Thus, this research uses quantitative models for significant decision making for problems in the public sector, which can also be used as a reference for similar studies in the future.

The next section develops the research model's theoretical basis and the hypotheses of the study. The third section presents the research methodology and the scales of measurement used. The fourth section presents the obtained results, which will be analysed in the discussion section, which also outlines the main academic and professional implications of the study.

2. Conceptual background

2.1. Blood donation services according to TSR

TSR integrates consumer and service research, focused on creating enlightened changes and improvements in the welfare of consumer entities embedded in social systems and ecosystems [9]. As Rosenbaum et al. [9] state, whereas service research analyses are dependent on measures such as customer satisfaction and loyalty and, thus their influence on the profitability of service companies, TSR presents an argument for the personal and collective well-being of consumers and, in a broader sense, of both citizens and the entire global ecosystem. Some services, such as healthcare and education, are transformative services, and, as such, they have transformative mission [9]. TSR has mainly focused on services where the consumer is the recipient or beneficiary of increased well-being resulting from the exchange. However, consumers do not always seek their own welfare, but the welfare of others, which represents a gap in the literature [8]. Similarly Cavanaugh et al. [20] emphasise the difference between organizations that promote prosocial behaviours to generate specific consumption behaviours (e.g., buy, recycle, donate, or vote a particular way) from prosocial or helpful behaviour.

Blood donation provides an ideal setting to analyse a prosocial transformative service [8]. Blood is a key resource, required to meet the

needs of the healthcare system [11]. Blood donation is the act of a healthy person giving blood that will be used for someone else's transfusion therapy. However, blood is a non-pharmaceutical product which must come directly from humans through voluntary donation [21]. Thus, in citing its main characteristics, blood donation is an unpaid activity as well as anonymous, and it is carried out by voluntary and non-remunerated donors [22]. All of this takes place in a highly vulnerable environment where different circumstances (new medical procedures and treatment options, the ageing population, flows of migration, seasonal supply shortages ...) resulting in imbalances in supply and demand (e.g., Refs. [23,24]). In this setting, as Leipnitz et al. [25] point out, the collection of blood from donors is a major social activity and donor management is a substantial challenge for non-profit organizations [8]. also stress that it is important to understand how donors' experiences can be optimized in order to ensure that blood donation continues as a prosocial transformative service.

The data reveal the low percentage of donors in the eligible population and, moreover, the low conversion rate of first-time donors to repeat donors. This scenario highlights the difficulties in recruiting and retaining donors [26], which represents a challenge for the fulfilment of the transformative mission of the blood donation system [8]. This research aims to analyse factors that enhance and deter donor behaviour in active donors.

2.2. The SDL blood donation service

Donors' behaviour in the creation of social welfare may be analysed by using SDL [18]. SDL provides perspective on the role of the consumer in the creation of service value, which can be applied to blood donation (e.g., Ref. [27]). SDL [18] proposes that service is the key basis of exchange, since service represents the application of resources for the benefit of others. This theory describes a network structure for co-creation value, whereby all social and economic factors (consumers, employees ...) are resource integrators in the service-based ecosystem. As a result, all factors integrate resources and engage in a service exchange in order to create value, as consumers are operant resources in service ecosystems. Regarding blood donation services, Russell-Bennett et al. [28] explain that blood donation is a 'people-processing' service, where the means of exchange is bodily fluid, not money. As the customer participation is critical to value co-creation [18], donors would be key players in the blood donation service ecosystem. Furthermore, donors are the sole providers of blood donation; they are service providers who provide physical resources (their own blood) for the consumption of the transformative service experience to assist the well-being of others [8].

In regard to SDL, Frentz et al. [19] explain that the reciprocity of value propositions between players is required; therefore, they are equitable exchanges. For this purpose, players must be willing to collaborate and be flexible in order to align the needs of both parties. Value propositions can be explained by the benefits and value that an organization offers to a consumer in exchange for a price. According to this scenario, it is not enough that there is a need to donate blood in society to incite individuals to donate. Instead, each individual will have to analyse why he or she would like to donate, the costs of donating and, in the final analysis, whether they donate at all. Chen et al. [12] also support that blood donors seek to maximise the exchange value in the market, whereby value is the result of comparing the cost/benefits ratio of the exchange. Furthermore, understanding the antecedents of consumers' future behaviour is particularly relevant for blood donation services, as blood donation is a unique exchange. The donor does not receive a product or service in exchange for monetary payment, but voluntarily gives his or her blood (e.g., Refs. [22,29]). Increasingly, the literature supports holistic approaches to the study of donor behaviour, far beyond the act of donating (e.g., Refs. [12,29]). On the other hand, service experience is a factor to be considered in donor behaviour, and therefore, research on the behaviour of the active donor would contribute to understanding of the concept of a 'donor career'. The

concept of ‘consumer career’ is recognised in literature (i.e., Refs. [30, 31]) and attempts to analyse the nature of the factors that influence individuals in terms of their experience with the product or service. Donor careers can be defined as individual behavioural sequences and corresponding donor statuses. If human behaviour was static, once an individual donates, he or she will continue to do so for the rest of his or her life. However, this is not the case [23].

Literature depicts the more important role of value creation customer. For instance, Grönroos and Voima [32] explain customer-dominant logic (CDL), as a way of thinking which underlines the customer mindset in creating a successful business. In order to obtain customers, service providers should create an offering (service) that customers are willing to seek and pay for. However, rather than services which involve customers, customers involve themselves in providing services, as consumers choose the service offer that best suits their circumstances (other consumers, other service providers ...). Thus, a service provider needs to understand how to accommodate the customer’s ecosystem. Regarding blood donation, this would involve donation centres’ full understanding of how they match donors’ needs in order to design their value proposition.

Based on the above, this research examines value-enhancing and value-destroying factors from the perspective of the active donor as a blood customer-provider. From the SDL [18], donors, as consumer-providers, would co-create value by donating their blood, but require a balanced relationship between the benefits and costs of the act of donating, as suggested by Chen et al. [12]. This balance is even of greater concern in experienced donors, where the act of donating does not always resolve perceived barriers, as revealed by different studies, such as Mohammed and Essel [13].

2.3. Blood donation services: to donate or not to donate

Blood donation centres need a full understanding of donor behaviour to maximise the donor experience value as the objective is to obtain and retain regular donors to meet the ongoing demands of the health system. However, donating is giving, which is in itself a complex behaviour, involving multiple factors. To understanding the intention to donate, these factors must be analysed, which may take place before, during and after the donation [29]. Ibrahim et al. [33] have noted that, beyond the act of donating, it is necessary to assess other factors that may influence donor behaviour, such as motivations and barriers to donating.

The following is an attempt to explain a number of factors that act as antecedents to donor behaviour and which must be considered as a whole. Based on the above, we argue that in order to ensure the continued supply of blood, rather than compensating a dissatisfied donor for a failed donation, complex experiences need to be managed.

2.3.1. Motivations as drivers to blood donation

Motivations are related to reasons or considerations that justify conscious and unconscious decisions about an action [34]. Regarding blood donation, Guidi et al. ([35]; p.339) define motivation as ‘the process of activating the individual in order to reach a goal (objective), taking into consideration the environmental conditions in which she/he is situated’. They relate motivations to factors which spurs blood donors toward the act of donation. In regard to the drivers of blood donation, the literature recognises the importance of altruism as a major motivating factor for donating blood (e.g., Refs. [36,37]). For instance Guidi et al. [35] highlight that blood donating is one of the sincerest gestures of ‘pure altruism’, as donors don’t know the person who will receive blood and therefore, donors don’t expect direct compensation. This is supported by different theoretical approaches, as well as TSR and SDL. From the TSR (prosocial transformative service consumption) perspective, Mulcahy et al. [8] also recognise altruism as a paramount factor of prosocial behaviour. As they explain, consumers of a prosocial transformative service (such as blood donation) demand a greater degree of personal time (time for the act of donating, waiting time and/or

post-donation recovery time). In this setting, where prosocial transformative services benefit others, the service’s success depends on a strong degree of morality, altruism, and emotional commitment. From the perspective of SDL, Frenz et al. [19] explain that altruistic motivations are the driving force in creative value in prosocial behaviour. Bednall et al. ([38]; p. 87) also outline that both altruism and an intrinsic obligation to help others would be forms of prosocial motivation, as ‘they represent a desire to have a positive impact on other people or social collectives through blood donation’.

In regard to literature, the study of motivations to donate blood has been extensively discussed (e.g., Refs. [38,39]), and continues to be a topic of considerable interest to researchers at the present time (e.g., Refs. [26,37,40]). Some studies analyse donor motivations from the perspective of non-donors (e.g., Ref. [41]), donors (e.g., Ref. [42]), and non-donors versus donors (e.g., Ref. [43]). As Ferguson et al. [40] point out, more research is required on the typology of donor motivations to identify new and less common motivators. Recent studies also attempt to identify the role of motivations in individuals who have already donated (e.g., Ref. [44]), while statistics reveal that a proportion of first-time donors do not ever donate again [26,45]. For instance, Moze et al. [46] empirically demonstrate that self-satisfaction and social contribution are the most common motivating factors affecting the eventual return of first-time blood donors. Literature also suggests that the effectiveness of motivations depends on the type of donor, degree of experience or donor career (e.g., Ref. [35]), with some motivations becoming ineffective (e.g., extrinsic motivations) as the number of donations increases (e.g., Ref. [39]). For instance, Chen et al. [12] note that some motivations may not be accumulated (such as, preferential medical policy), and other motivations (such as blood test and medical examination) are only required once. Also, Masser et al. [47] explain that, for experienced donors, the perceived ‘pressure’ to donate depends more on internal motivations than external factors, and decisions to continue donating are focused mainly on those motivations or factors related to donor identity (e.g., perceived responsibility or moral obligation to donate).

Based on the above, it is necessary to identify what kind of motivations, and under which contexts, prevail as benefits in the donor’s value proposition and, therefore, predispose the donor to be a co-creator of transformative social value (donating blood to the public health system). Some studies outline that these personal motivations could behave dynamically, depending on the donor’s experience (e.g., Ref. [35]) and the type of donor (e.g., Ref. [29]), so that it is interesting to know the motivations of current donors, in order to reinforce their future intentions.

2.3.2. Obstacles as donation inhibitors

Obstacles describe reasons why people do not donate or have stopped donating blood [48]. Ngoma et al. [49] also describe barriers as those factors that deter blood donation. Similarly, Ferguson and Lawrence ([26]; p. 640) explain that ‘the blood donor makes a gift of blood’, as a voluntary act, at a personal cost to the donor, that generates an immediate or long-term health benefit to the recipients. Regarding the personal cost to the donor, it might include obstacles such as time and effort to donate, physiological costs caused by blood loss, pain and discomfort, and psychological costs (anxiety, fear, and doubt), among others.

The donor’s cost of donating has been acknowledged in the literature from different approaches. According to TSR, Mulcahy et al. [8] outline that in transformative services, such as blood donation, prosocial behaviour can require effort or cost (physical, emotional, temporal ...). Thus, transfers of physical resources (blood) would demand that blood donors overcome obstacles (fear of needles, pain, waiting time, recovery time post-donation ...). From the SDL perspective, Ghatak [50] states that obstacles deter donors’ willingness to participate in service ecosystems. Some studies (e.g., Refs. [51,52]) also indicate that barriers to blood donation would have a negative effect on the value of the

donation from the donor's perspective at any stage of the donor's career. Barriers might be identified as social costs, as Zainuddin and Gordon [52] point out that monetary and non-monetary costs versus the monetary and non-monetary benefits determine the social price of engaging in socially desirable behaviour. Furthermore, they note that barriers are factors which contribute to reducing the value in social behaviour. Regarding blood donation, they explain that, for instance, if a donor is willing to donate blood but it is difficult to find a parking space nearby in the blood service tent, this situation would erode the value.

Padilla Garrido et al. [53] acknowledge that research on factors that deter donation is lacking, which includes an inadequate location, lack of knowledge about the donation process, or previous adverse experiences. Zucoloto et al. [54] also argue that although the literature has analysed psychosocial factors relating to blood donation, further research is needed to determine reasons for not donating and their impact on blood donation behaviours among different population groups. Regarding the research approach, some studies evaluate only barriers of non-donors to donate (e.g., Ref. [41]), or donors (e.g., Ref. [55]). Other studies analyse both the motivations and barriers depending on one's donor career, such as non-donors (e.g., Ref. [56]), donors and non-donors (e.g., Ref. [57]), or first-time and repeat donors (e.g., Ref. [13]), among others. Regarding the appropriateness of studying only barriers to blood donation as antecedents to the intention to donate, literature seems to support their joint study. Some studies note that motivations promote donation, as long as obstacles represent an acceptable minimum, being necessary to enhance motivations to donate, but also to reduce obstacles or hindrances to blood donation [44,58]. Bednall and Bove [59] add that multiple motivators could have cumulative effects on motivations, whereas a single deterrent might decrease the intention to donate. Hupfer et al. [39] also propose that more research is needed on how the equilibrium between positive and negative motivations might shift over the course of a donor's career. On the other hand, Cacioppo and Gardner [60] argue that rather than treating negative and positive motivations as factors within a negativity-positivity continuum, it is recommended that they be treated individually. They suggest that the negative component (e.g., negative beliefs and fears) is the critical obstacle to donation, and therefore, donor recruitment and retaining strategies should endeavour to reduce these fears. In this regard, Polonsky et al. [61] state that, although removing barriers is a critical action as these barriers deter people from even considering to become blood donors, the removal of barriers is a hygienic factor and is insufficient on its own to motivate the act of donating blood. In this context, they observe that social marketing campaigns should address donor behaviour in a multifaceted manner, removing obstacles as well as enhancing motivations for donating (facilitators, incentives ...).

Based on the above, motivations and obstacles to donate need to be studied together. Donor experience seems to influence the balance between motivations and barriers, while some studies (e.g., Ref. [29]) show that the higher one's intrinsic motivation to donate, the lower the impact of some donation costs. Thus, it is interesting to study the motivations and obstacles of current donors, in order to understand their future intentions.

2.3.3. The act of donating: service quality, routine encounters and recovery encounters

Grönroos and Voima [32] propose three spheres of value creation. At the *provider sphere*, the firm is a value facilitator, and the service provider provides resources and processes for customers' use. Value creation at the *joint sphere* (value-in-exchange) is developed by the interaction (dialogical process) between customers and service providers. At the *customer sphere*, customers are co-creators of value due to their accumulated experiences with resources, processes, outcomes and contexts (value-in-use). According to this, regarding blood donation, the act of donating blood would be circumscribed to the joint sphere of value creation, where the donor and the staff of the blood donation unit meet to participate in the blood donation process. As the literature

points out, a service encounter is the interface between customers and the service provider, which is also recognised as 'moment of truth', because what happens during a service encounter will be analysed for customers to judge how the business functions, such as service quality. Regarding critical cues to evaluate a service encounter, the environment should be considered holistically, as a composite of some dimensions (such as, tangibles and personnel). Every point of contact between the consumer and front-line staff may have a strong impact on service evaluation [62]. Regarding the state of literature on quality dimensions for blood donation services, there is a growing interest in the quality of donation process service (e.g., Ref. [63]), although more research on scales and dimensions of service quality is required. As exceptions, Kafere and Garad [64] analyse donor service quality using the SERVQUAL model. Pahyastri and Henriyani [65] propose five dimensions of service quality: Core service, human elements of service, systematization of service delivery (non-human element), tangibles of service, and social responsibility. Kokcu [66] uses a questionnaire for assessing the quality of blood donation services during three phases: Pre-donation process, blood donation process, and post-donation process. Nevertheless, there is a need for the identification of statistically reliable and valid quality scales.

Based on service literature, service quality would be the quantitative difference between service expectations and perceptions of the service [67]. It is suggested that blood banks continuously monitor changing donor expectations [12]. As Grönroos and Voima [32] note, to the extent that the service provider has a better understanding of the customer, the provider will be a co-creator of value rather than a mere service facilitator. The better the needs of the donor are understood, the better the service encounter (act of donating) can be managed, thus creating value. Ghatak [50] also outlined that meeting customer expectations contributes to the successful integration of the customer into the value creation process. Likewise, negative prior donation experience might be barriers to subsequent blood donations; conversely, staff awareness and empathy toward donor fears also could be effective in overcoming these barriers [68].

In regard to the level of quality in the donation process, blood donation centres operate with high standards of performance during the act of donation, such as the protocols and recommendations provided by the American Red Cross, which contributes to ensure the quality of service. Nevertheless, while expectations become more realistic with experience, the level of quality perceived by the donor may also increase. Hossain Parash et al. [69] note that a lack of knowledge about the donation process generates misconceptions that deter the intention to donate. Also, Kokcu [66] found that while medical personnel meet the quality standards in the blood donation procedures, donors required more information about blood donation process before the donation and more care at the needle puncture site after the donation. Although the quality of service during the blood donation process might be recognised, Chen et al. [12] suggest that blood banks should increase the value of donation, for example, by providing information on the destination of the blood, thus increasing donor loyalty. Consequently, the service quality of the donation process would contribute to donor satisfaction (e.g., Ref. [63]), but even this may not be sufficient.

Service literature recognises two types of service encounters: Routine service encounters and recovery service encounters. Routine encounters are those that meet customer expectations and therefore contribute to customer satisfaction and serve to increase customer loyalty. Recovery service encounters are aimed at compensating the customer and rectifying the mistakes made the first time [70,71]. Recovery service strategies (such as financial compensation) are designed as a means to achieve customer retention, although companies should avoid failures by designing proactive plans to prevent potential mistakes [72]. Arsenovic et al. [73] highlight the combination of compensation and collaboration between firms and customers to mitigate negative customer responses under service failures. The role of the customer as a co-creator of value in recovery encounters is receiving increasing

attention in the literature, are being analysed from an SDL perspective (e.g., Ref. [74]) and CDL (e.g., Ref. [75]). Regarding recovery encounters in prosocial behaviour, such as blood donation, recovery strategy would be difficult to establish. To the extent that donor motivations and barriers are dynamic, the social price of donating [52], which could be a benchmark for compensating the donor for service failures, is also dynamic. Furthermore, considering that blood donation is a socially transformative service [8], the cost-of-service failure would not only affect the donor but, above all, society at large. Thus, rather than managing the recovery of a service failure, donation centres should focus on donor recovery management.

Based on above, this research proposes a scale for measuring service quality in blood donating from active donor perspective. It is worthwhile to explore donor profiles with different levels of perceived quality in the donation process, and their relationship with motivations and barriers as antecedents of donor performance. Furthermore, the simultaneous effect of motivations, barriers, and perceived quality on donor satisfaction and behavioural intentions is examined.

3. Research model and hypothesis

This research aims to measure the direct and indirect effects of motivations and obstacles for active donors that effectively predict their future behaviour, which provides a deeper insight into the donor's career (Fig. 1). In addition, by analysing the service experience from the donor's perspective, the influence of motivations and obstacles on the decision to donate once again and to recommend donation to others is also measured. This research also analyses donors with different levels of experience, which will enable the identification of donor clusters. As Bove et al. [29] point out, the difficulty of attracting or retaining donors with generic marketing strategies highlights the complexity of blood donation behaviour and the need to identify donor profiles. From SDL [18] and TSR [9], this model addresses the antecedents of the future behaviour of the active donor as co-creator of the blood donation system and supporter of a collective welfare. Based on Mulcahy et al. [8], donor satisfaction and loyalty would be predictors of repeat transformative

service usage. In addition, different phases of the service experience are approached because different points of encounter with the blood donation service are analysed (before, during and after donation), as well as different aspects of the service (staff performance, physical design of the facilities, and donor accessibility ...).

3.1. Motivations and donors' performance

In the research model (Fig. 1), it is proposed that motivations positively influence donors' performance (satisfaction and attitudinal loyalty). Donor motivations are complex, diverse, and dynamic, as evidenced by diverse studies (e.g., Refs. [35,40,46]), and therefore, so is the influence of motivations on active donors' performance. Literature suggests that altruism [76], incentives [25], facilitators [77], and campaigns are intrinsic or extrinsic motivators to donate blood.

Services literature supports motivations as antecedents of individual satisfaction and loyalty [78–80]. Satisfaction can be understood as an evaluation of the service experience, either specific or overall, influenced by service quality, among other factors [81]. From a TSR perspective, according to Mulcahy et al. [8], customer satisfaction would be a service outcome, which provides relevant data for managing transformative services. Mazzarolo et al. [82] explain that motivations are antecedents to satisfaction. Through the service experience, the individual chooses to fulfil their expectations or to achieve their intended rewards or advantages. Prebensen et al. [83] stress that motivations drive behaviour, which affects the individual's attitude in general and dimensions of behaviour such as involvement, perception and satisfaction. Moreno Gil and Ritchie [71] also argue that motivations have a positive impact on the emotional response to taking an action or purchasing a product or service. In addition, they indicate that this affective evaluation can have more weight than the cognitive evaluation (knowledge of the product or service's characteristics) in the overall satisfaction of the individual. Nevertheless, to the best of our knowledge, the relationship between motivations and overall satisfaction in the donor experience has scarcely been examined in literature. It is of interest to analyse what motivations most influence the satisfaction of the

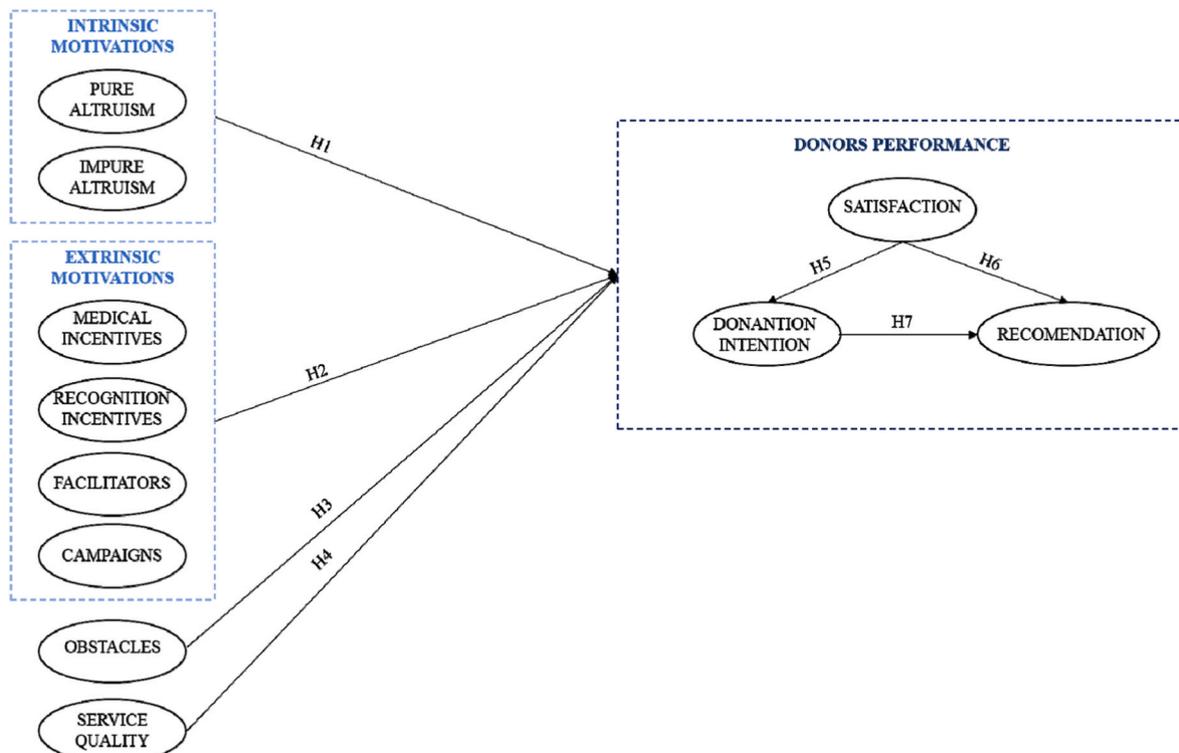


Fig. 1. Proposed model.

active donor.

From TSR, Mulcahy et al. [8] emphasise customer loyalty as a critical service outcome for pro-social transformative services. From SDL, Woratschek et al. [84] describe customer loyalty as a service outcome in value co-creation. Chen et al. [12] demonstrate that the intention to donate consistently has a positive impact on repeated blood donation behaviour. As for the relationship between motivations and customer loyalty, several studies support motivations as antecedents of customer loyalty, such as Schüler et al. [7]. Concerning donation service, literature also outlines the role of motivations on donor future behaviour [44, 77,85]. Žemgulienė [85] demonstrates that donor motivation has a positive effect on loyalty (attitudinal loyalty and behavioural loyalty). In a study on first-time donors' behaviour, Moze et al. [46] support that, mainly, self-satisfaction and making a social contribution are motivating factors which cause the donor to return to blood donating. Consequently, motivations would have a positive effect on donor performance. Similarly, Sallem [86] empirically demonstrates that when people are internally motivated, they would improve their attitude (understood as favourable or unfavourable feelings towards blood donation), and therefore cultivate a higher behavioural intention.

Therefore, the following hypotheses are presented.

H1. Intrinsic Motivations Positively Influencing Donors' Performance.

H2. Extrinsic Motivations Positively Influencing Donors' Performance.

3.2. Obstacles and donors' performance

The research model (Fig. 1) proposes that obstacles negatively influence donors' performance. Obstacles describe reasons why people do not donate or have stopped donating blood [48]. Consequently, obstacles describe negative aspects of the donation experience not necessarily resolved in the donation process.

From SDL, Ghatak [50] states that obstacles deter the willingness to participate in service ecosystems. To the best of our knowledge, the relationship between obstacles and global satisfaction has been scarcely examined in literature. Anand et al. [87] also confirms a negative relationship between perceived risk, as a barrier, and customer satisfaction. The relationship between obstacles and satisfaction requires further investigation, since, as Cronin and Taylor [88] point out, customer satisfaction may be more predictive of purchase intentions than service quality. This occurs because consumers do not necessarily purchase the highest quality product due to constraints of cost, budget or availability, among others. For instance, in the healthcare sector, Shamsi et al. [89] note that language barriers in healthcare cause communication problems between the medical professional and patient, decreases both parties' satisfaction. As for blood donation, blood donor barriers have been minimally studied in the literature [54] as well as their effect on donor satisfaction. Considering that sensitivity to donation costs may change by donor type (e.g., Ref. [29]) or that experience may reduce the impact of certain costs or barriers (e.g., Ref. [69]), it is important to understand how barriers affect the satisfaction of active donors.

Regarding the influence of barriers on consumer loyalty, Ravald and Grönroos [90] explain that if satisfaction depends on value, it depends on the total costs or sacrifice. In regard to blood donation, literature also seems to support that the belief that obstacles have a negative effect on donor loyalty. Among the academic contributions, Martín-Santana and Beerli-Palacio [77] state that both internal inhibitors (beliefs, attitudes and feelings aroused by blood donation, such as fear of needles) and external inhibitors (opportunity cost of donating blood, such as lack of time) have a negative effect on the intention to donate again. Veerus et al. [91], also point out that, among others, unsuitable opening hours for blood donation or adverse side effects following blood donation may deter donors from donating again. Kuttah and Mohan [42] point out that inconveniences of any kind in a blood bank are barriers to donation, deterring recruitment and retention of blood donors. Furthermore, Veerus et al. [91] explain that donors who are anxious before the

donation or afraid of being punctured by a needle are more likely to have negative reactions (such as adverse reactions) during the donation process. These episodes would cause donors dissatisfaction with the current donation experience and, therefore would deter their willingness to donate again. Once again, more empirical studies analysing the effect of active donor barriers on future behaviour are needed. Several studies suggest that the effect of donor barriers may depend on donors' motivations (e.g., Ref. [29]) or on their level of their experience (e.g., Ref. [69]). As Mohammed and Essel [13] point out, the joint study of motivations and barriers to donating blood allows interesting conclusions to be drawn to increase the number of donations, while contributing to closing a gap in the literature.

Therefore, the following hypothesis is presented.

H3. Obstacles that Negatively Influence Donors' Performance.

3.3. Service quality and donors' performance

The research model (Fig. 1) proposes that service quality enhances donors' performance. Service quality is the assessment of discrepancies between consumers' expectations and their perception of the dimensions and attributes that explain the quality-of-service experience [92]. Service quality and experience literature include the context in which the experience arises, followed by the journey of mapping and measurement dimensions of customer experience [93]. According to Ferreira et al. [17]; understanding and improving the customer experience in any healthcare service must be on the agenda of policymakers. Ocampo et al. [94] outline that the public sector must serve the public interest, with service quality playing a key role in describing important dimensions to focus policies on. In addition, supporting evidence shows that quality service has a positive effect on customer satisfaction [2,88, 95]. Some studies also support that service quality improves customer loyalty (i.e., Ref. [96]).

In blood donation, Fardin et al. [63] and Martín-Santana and Beerli-Palacio [77], confirm that the perceived quality during the donation process has a positive influence on donor satisfaction with the donation process. Mugion et al. [22] indicate that service quality contributes to ensure donor satisfaction and loyalty, as bad experiences (long waiting times, unqualified staff ...) would damage donor satisfaction and loyalty. Pangestika and Syarifah [97] empirically confirm that the quality of blood donation services has a significant influence on blood donor satisfaction. Chen et al. [12] also find that quality service that blood donors receive during blood donation improves donor satisfaction. Veerus et al. [91] point out that the importance for first donors to have a positive first-time blood donation experience (i.e., acceptable waiting time at the reception, doctors/nurses' politeness during the clinical exam ...) to become regular donors. From an empirical point of view, Martín-Santana and Beerli-Palacio [77], confirm that service quality has a positive direct effect on donors' intention to return and a positive indirect effect on recommendation for donating blood. However, measuring the quality of the act of giving is a complex process, since it the act of donation is a moment of truth, which can contribute to an optimal management of the donor's motivations and/or barriers (e.g., Refs. [29,38,68,98]). As Mohammed and Essel [13] note, perceived service quality might depend on donor experience. In addition, although some studies provide data on the critical aspects of managing blood donation service encounters (e.g., Refs. [63,64]), further studies are needed to statistically validate the scales for measuring donor-perceived quality. Therefore, the study of service quality in donor satisfaction and attitudinal loyalty can provide novel insights.

Therefore, the following hypothesis is presented.

H4. Service Quality Positively Influences Donors' Performance.

3.4. Satisfaction and donor attitudinal loyalty

The model research (Fig. 1) proposes that satisfaction positively

influences donor attitudinal loyalty. Several studies support the influence of satisfaction on future customer behaviour [2,96]. Thus, highly satisfied customers would become more loyal and willing to maintain long-term relationships with the organization [5]. Ferreira et al. [17] explain that organizations must ensure that their consumers are satisfied with services and outcomes, otherwise consumer loyalty would be low. Huang and Sudhir [1] also outline that service satisfaction positively influences consumer loyalty, although this effect would be greater for more difficult types of services.

Regarding the donation service, Jaafar et al. [99], explain that positive experiences contribute to increased donor loyalty, meanwhile, negative experiences (e.g., adverse effects) hinder donor loyalty. Russell-Bennett et al. [100] empirically demonstrated that satisfaction positively influences donor loyalty. Weidmann et al. [101] find that overall donor satisfaction during the last donation is an important predictor of the intention to return. Boenigk and Helmig [102] empirically confirm that donor satisfaction has a strong influence on loyalty, which was measured by the willingness to donate again, willingness to donate more often, and positive word-of-mouth behaviour about the organization. Furthermore, blood donor satisfaction is a positive psychological effect, which would be a motivational factor in encouraging repeat donorship [45]. Martín-Santana and Beerli-Palacio [98] also confirm that donor satisfaction enhances donor loyalty. However, the conversion rate from first to second and third donation is low, which generate a paramount problem to the health system [26]. Considering that a regular donor is a donor who has donated at least four times [26,103], this setting represents a major challenge for blood banks. To the extent that the research model includes both motivations and obstacles to donation, the relationship between donor satisfaction and behavioural intentions can certainly provide meaningful data.

Therefore, the following hypotheses are presented.

H5. Satisfaction Positively Influences Donors' Intention to Return.

H6. Satisfaction Positively Influences Donors' Intention to Recommend.

3.5. Intention to return and intention to recommend

The research model (Fig. 1) proposes that the intention to return enhances the intention to recommend. Consumers will tend to generate a commitment to the company or brand that leads them not only to repeat the purchase, but also to recommend it to others [104]. Since the literature suggests that behaviour among donors is heterogeneous (e.g., Refs. [29,103]), the relationship between what I am willing to do and what I recommend to others is relevant. Likewise, repeat donors would also prescribe the service by motivating others to donate [77,105]. The relationship between a donor profile and the intention to recommend donation to others would allow identifying those types of donors to be willing prescribers of the service. Thus, it is suggested that they would be co-creators of value in the blood donation service in the consumer sphere, within the stages of value creation explained by Grönroos and Voima [32]. Although Martín-Santana and Beerli-Palacio [77], have confirmed this relationship, it has been scarcely addressed in literature.

Based on above, the following hypothesis is presented.

H7. Intention to Return Positively Influences Donors' Intention to Recommend.

4. Methodology

4.1. Sampling

An online survey has been used as a data collection tool. The study population consisted of active donors, i.e., men and women over 18 years of age who live in Spain and have donated blood at least once over the past two years. An online questionnaire was used in this study. In

Spain, blood donation is the responsibility of the blood transfusion centres which are 'health centres for the collection and analysis of human blood or their components, regardless of the purpose that they are used for, including treatment, storage and distribution as used for transfusion' ([106], p. 31292). Fourteen of the seventeen transfusion centres in Spain and several Spanish public and private universities participated in the distribution of this questionnaire. The centres sent an email to the donors registered in their databases with the URL address of the online platform containing the questionnaire. The universities also solicited the participation of their university community (teachers, students, management and service staff) in the study by sending them an email through their institutional email systems. Moreover, all these institutions used their main social media accounts and their own platforms to disseminate the URL address. In the end, a final sample of 30,619 subjects was obtained.

The Spanish blood donors' sociodemographic profile (see Table 1) is characterised as having participation by both sexes (Male 47.2% and Female 52.8%), with an even age distribution among the different intervals. It also features a majority of individuals with university level study (51.8%). Most donors are employed (77.6%) with monthly incomes ranging from 1,000 to 2,000 euros (39.4%).

4.2. Measurement

4.2.1. Intrinsic motivations

Intrinsic motivations were assessed by means of seven dichotomous (Yes/No) items adapted from literature (i.e., Refs. [107–109]). They include all those motivations of an internal nature related to an individual's altruistic behaviour, whether pure or based on self-interest. However, this paper does not consider intrinsic motivations as a global, i.e., second-order, construct. We have only collected different types of intrinsic motivation found in the literature under a single sub-heading to facilitate the understanding and reading of the paper. Therefore, in the validation procedure of the measurement models, each of the intrinsic motivations is treated as latent formative constructs of a first-order model.

4.2.2. Extrinsic motivations

Extrinsic motivations were made up of 13 dichotomous (Yes/No) items adapted from literature (i.e., Refs. [107,108,110]). They include all those motivations that have an external origin and that can provide incentives to increase an individual's donations. These motivations can be grouped into three categories: facilitators, incentives and

Table 1
Sample profile.

Sociodemographic characteristics	N	%
Sex		
Male	14,464	47.2
Female	16,155	52.8
Age (years)		
18–25	5,440	17.8
26–35	6,186	20.2
36–45	8,336	27.2
>45	10,657	34.8
Education		
No education or primary	3,786	12.4
Secondary	10,972	35.8
University	15,861	51.8
Employed		
Yes	23,750	77.6
No	6,869	22.4
Total/monthly income (€)		
≤1,000	4,479	14.6
1,001–2,000	12,065	39.4
2,001–4,000	10,931	35.7
>4,000	3,144	10.3
Total	30,619	100.0

communication campaigns and urgent calls. In this case, they are also considered as latent formative constructs of a first-order model, analogous to intrinsic motivations.

4.2.3. Obstacles

Obstacles were measured by six dichotomous (Yes/No) items adapted from literature (i.e., Refs. [61,111]), as latent formative constructs of a first-order model. They include all those aspects that prevent an increase in the annual number of donations, whether of an internal or external nature. In this study, since these were active donors, a series of obstacles more typical of non-donors, such as fear of needles, fear of blood or alternatively, a lack of information about the donation process or donation points were not included.

4.2.4. Service quality

Service quality was measured by means of a 17-item, 7-point Likert scale, in which 1 represented a 'very negative assessment' and 7 a 'very positive assessment'. This scale was intended to measure several aspects related to the donation centre where the individual usually donates blood. All the attributes collected in this scale are based on literature [77,91]. The proposed scale consisted of four dimensions: Tangibility (3 items), Accessibility (4 items), Personal Attention and Professionalism (7 items) and post-Donation (3 items). It can be affirmed that this scale represents each stage of the donation experience, as well as tangible and intangible aspects of the process. This formative scale of service quality is a second-order model consisting of four reflective dimensions. Thus, each of the first-order dimensions of the model - tangibility, accessibility, personal and professional care, and post-donation - is influenced by service quality.

4.2.5. Satisfaction

Satisfaction was measured with a 1-item, 7-point Likert scale, where 1 meant 'completely dissatisfied' and 7 meant 'completely satisfied', in order to evaluate donor satisfaction with the donation centre. The works of Martín-Santana and Beerli-Palacio [77] and Morgeson [112], support using a single item to measure this reflective construct.

4.2.6. Donation intention

A 7-point Likert scale of two items was used for measuring donation intention [113,114]. Also, in this scale, 1 indicated a 'strong disagreement' and 7 indicated a 'strong agreement'. In this context, and given that they are already blood donors, the donation intention refers to their willingness to increase their current number of donations. It is a reflective-type scale.

4.2.7. Recommendation

A 7-point Likert scale of two items was used for measuring recommendation, where 1 meant 'totally disagree' and 7 'totally agree'. Future behavioural intentions to recommend the service experience have been widely recognised in literature [102,115,116]. It is also a reflective scale.

In sum, while satisfaction, donation intention and recommendation are posited as reflective constructs, all other constructs in the presented theoretical model are designated as formatives. Service quality is a second-order model, in which dimensions were considered as reflective, but the service quality construct is considered as formative.

Appendix A shows the final items in the scales. All measurement scales were pre-tested by the 14 Spanish blood transfusion centres participating in the project and by 20 active donors. To carry out this pre-test, each of the 14 centres participating appointed a collaborator who would be the direct contact with the research team. The first step in the pre-test process was to contact each of them by telephone and explain the procedure to follow in order to pre-test the questionnaire. The centres validated the content of the scales, and their suitability for the blood donation context. Changes resulting from active donors were minor and limited to changes of words to more colloquial ones and

simpler sentence structures. The stages of the process followed in the pre-test are described in Appendix B.

5. Analysis and results

For data analysis and hypotheses validation, a partial least squares estimation (PLS) model was chosen in this research. This choice was based on the fact that PLS is particularly recommended when there are formative constructs included in the model [117], as in this study. So, to test our model, SmartPLS3 was used for assessing both the measurement instrument and the structural model.

The analysis and interpretation of a statistical model throughout PLS-SEM requires a two-stage approach. The first stage concerns the validation of the measurement model, whereas the second stage refers to the analysis of the structural model [118]. However, given the fact that the proposed model includes a multidimensional variable (service quality), SmartPLS requires the application of the build-up approach process.

5.1. Validation of measurement scales

In the case of formative items, the recommendations of Diamantopoulos [119] were taken into account. Firstly, we have analysed the possible problems of multicollinearity between indicators, for which we have calculated the variance inflation factor (VIF) values, which were below the recommended threshold of 3 as shown in Table 2 [118]. Secondly, the weights of the indicators have been analysed, as well as their significance, in order to determine the relative relevance of each of them [118]. As the result of this analysis, it may be noted that all weights are significant (Table 2), except for the variables 'MEDINC1', 'RECINC1' and 'OBS4', which should be maintained because their loading is equal or higher than 0.5 and therefore, significant [118]. Also, the variable 'CAMP1' was kept ensuring the content validity of the dimension since it has a significant loading despite its less than 0.5 value [118].

In the case of reflective items, the following criteria must be considered: (1) individual reliability, (2) composite reliability, (3) convergent validity, and (4) discriminant validity. In this regard, due to the multidimensional nature of service quality, the measurement scale of the first-order model was analysed; and, in this case, all the items found in this model were reflective.

The individual reliability study was carried out by considering the indicator loadings (λ) in their corresponding constructs. In this step, all items were higher than the threshold of 0.7 established by Carmines and Zeller [120], thus assuring that all indicators represented 50% of the construct variance as minimum [121].

The composite reliability criterion was examined by means of the criteria established by Nunnally and Bernstein [122]. This criterion sets the minimum threshold of Cronbach's alpha values of 0.70 as a sufficient level for "modest" reliability in the early research stages. In this study, all Cronbach's alpha values exceed 0.7, except for *Donation intention* (0.574). More recent studies indicate that the Dijkstra-Henseler's indicator (ρ_A) provides greater robustness as a measure of consistent reliability and should be greater than 0.7 [123]. In this study, all the ρ_A coefficients were higher than 0.7, except for *donation intention*, which stands at 0.605.

Furthermore, the convergent validity analysis was used to evaluate the average variance extracted (AVE) through the criterion set out by Fornell and Larcker [124]. This criterion sets the minimum value of the constructs as 0.5 [118]. All constructs exceeded this threshold, which means that each construct explains 50% of the variance of its indicators at a minimum. Table 2 shows the results of both reliability and convergent validity analyses.

To fully carry out the assessment of the first-order measurement model, we analysed its discriminant validity according to Fornell and Larcker's criterion [124]. As we can see in Table 3, the square root of the AVE of each construct (see the diagonal in italics in Table 3) was higher than the correlations between the other constructs. In addition, the

Table 2
Results of measurement models.

	Constructs	VIF	Weight	Loading	Alpha	CR	rho_A	AVE
INTRINSIC MOT.	Pure Altruism							
	PALT1	1.220	0.307***		n.a	n.a	n.a	n.a
	PALT2	1.121	0.475***					
	PALT3	1.291	0.472***					
	PALT4	1.234	0.176***					
	Impure Altruism							
	IMPALT1	1.083	0.528***					
	IMPALT2	1.116	0.661***					
EXTRINSIC MOT.	Medical Incentives							
	MEDINC1	2.796	-0.150	0.675***				
	MEDINC2	2.986	0.344**					
	MEDINC3	2.042	0.842***					
	Recognition Incentives							
	RECINC1	1.452	0.226	0.704***				
	RECINC2	2.195	0.400**					
	RECINC3	2.328	0.520***					
	Facilitators							
	FAC1	1.098	0.251***					
	FAC2	1.284	0.446***					
	FAC3	1.219	0.619***					
	Campaigns							
	CAMP1	1.177	0.062	0.425***				
	CAMP2	1.353	0.286***					
	CAMP3	1.225	0.466***					
CAMP4	1.239	0.544***						
OBSTACLES	Obstacles							
	OBS1	1.640	0.731***					
	OBS2	1.509	-0.280***					
	OBS3	1.224	0.166***					
	OBS4	1.479	0.028	0.492***				
	OBS5	1.417	0.594***					
SERVICE QUALITY	Tangibility				0.822	0.894	0.827	0.738
	TANG1			0.812***				
	TANG2			0.863***				
	TANG3			0.900***				
	Accessibility				0.723	0.826	0.750	0.543
	ACC1			0.664***				
	ACC2			0.736***				
	ACC3			0.732***				
	ACC4			0.809***				
	Personal Attention and Professionalism				0.929	0.943	0.932	0.704
	PA&P1			0.819***				
	PA&P2			0.750***				
	PA&P3			0.887***				
	PA&P4			0.892***				
	PA&P5			0.903***				
	PA&P6			0.868***				
	PA&P7			0.738***				
	Post-Donation					0.807	0.888	0.815
PD1			0.749***					
PD2			0.897***					
PD3			0.901***					
DONORS PERFORMANCE	Satisfaction			1.000	1.000	1.000	1.000	1.000
	Donation Intention				0.574	0.822	0.603	0.698
	DI1			0.785***				
	DI2			0.883***				
	Recommendation				0.853	0.931	0.856	0.871
	REC1			0.928***				
REC2			0.939***					

Note: VIF-variance inflation factor; Alpha- Cronbach's alpha; CR-composite reliability; AVE - average variance extracted; n = 10,000 subsamples; ***p-value < 0.001; **p-value < 0.01.

HTMT was below 0.9, thus providing evidence of discriminant validity [125]. Therefore, the proposed model has discriminant validity.

Having validated the measurement scale of the first-order model, the items of each dimension of the multidimensional variable (service quality) were grouped together. This was done in order to validate the second-order model. The validation process results of this second model appear in Table 4, where service quality is a formative construct.

First, VIF is carried out using the criterion of Hair et al. [118] and all the dimensions-indicators were lower than 3. Additionally, the weights

of all the indicators were statistically significant, and therefore, all of them were maintained [118]. Results are shown in Table 4.

5.2. Structural model analysis

Once the measurement scales were validated, the results of the structural model were analysed to test the relationships between variables in the hypotheses. To assess the structural model, three elements must be examined: Path coefficients (β), R^2 Determination coefficients

Table 3
First-order measurement model: Discriminant validity.

Constructs	TANG	ACC	PA	PD	SAT	ID	REC	TANG	ACC	PA	PD	SAT	ID	REC
TANG	<i>0.859</i>													
ACC	0.558	<i>0.737</i>						0.722						
PA	0.505	0.560	<i>0.839</i>					0.576	0.658					
PD	0.283	0.290	0.314	<i>0.852</i>				0.351	0.378	0.367				
SAT	0.346	0.395	0.518	0.258	<i>1.000</i>			0.381	0.451	0.536	0.288			
ID	0.188	0.218	0.240	0.134	0.273	<i>0.835</i>		0.272	0.323	0.325	0.195	0.358		
REC	0.143	0.156	0.195	0.161	0.189	0.283	<i>0.933</i>	0.171	0.188	0.219	0.193	0.204	0.396	

Note: TANG-tangibility; ACC-accessibility; PA-personal attention and professionalism; PD-post-donation; SAT-satisfaction; DI-donation intention; REC-recommendation; n = 10,000 subsamples. The diagonal in italics refers to the square root of the AVE of each construct.

Table 4
Second-order measurement model.

Constructs	Dimensions-indicators	VIF	Weight
Service Quality (formative)	Tangibility	1.589	0.119***
	Accessibility	1.739	0.243***
	Personal Attention and Professionalism	1.629	0.682***
	Post-Donation	1.146	0.193***

Note: VIF-variance inflation factor; n = 10,000 subsamples; ***p-value < 0.001.

(variance explained) and Q^2 values (cross-validated redundancy) [118]. In addition, following Hair et al. [118], bootstrapping (10,000 resamples) was used to generate t-statistics (Table 5).

To carry out the measurement of magnitudes and meanings, it must be previously verified that there is no multicollinearity between the antecedent variables of each of the endogenous variables [126]. This is achieved by using the model's VIF values. All the variables' VIF values

were below 1.501, so there was a low degree (VIF<3) of multicollinearity [118].

The structural model is assessed in regard to R^2 for each dependent variable and the significance of the paths. R^2 informs about the model's predictive capability and the exogenous variables' combined effect on endogenous variables, which should not be less than 0.1 [127]. Regarding redundancy indices with cross validation (Q^2), which examine the predictive relevance of the theoretical/structural model [118], it was observed that since the Q^2 indexes were greater than zero, the model had satisfactory predictive relevance.

In turn, the paths' coefficients (β) show the strength of relationships among the variables hypothesised in the model [118]. Table 5 shows that most β coefficients are significant, therefore, the most hypothesised relationships are empirically supported. So, it was concluded that the relationships were significant, except for the following relationships between: (1) Medical incentives and Recommendation, (2) Facilitators and Donation intention, and (3) Obstacles and Recommendation. Therefore, the partially accepted relationships in the model were H2 and

Table 5
Comparison of hypotheses.

	Path Coeff(β)	t-statistics	R^2	Q^2	Confidence Interval		Contrast
					2.5%	97.5%	
Pure Altruism → SAT	0.032***	5.441			0.021	0.043	Accepted
Pure Altruism → DI	0.066***	9.159			0.052	0.080	Accepted
Pure Altruism → REC	0.064***	9.089			0.050	0.078	Accepted
Impure Altruism → SAT	0.025***	4.055			0.013	0.037	Accepted
Impure Altruism → DI	0.055***	7.566			0.040	0.069	Accepted
Impure Altruism → REC	0.121***	17.464			0.107	0.134	Accepted
H1 Intrinsic Motivations → Donors' Performance							
Medical Incentives → SAT	-0.027***	3.790			-0.040	-0.012	Accepted
Medical Incentives → DI	-0.023**	2.991			-0.036	-0.007	Accepted
Medical Incentives → REC	-0.006	0.936			-0.017	0.007	Non accepted
Recognition Incentives → SAT	-0.018**	2.771			-0.031	-0.005	Accepted
Recognition Incentives → DI	0.016*	2.219			0.001	0.029	Accepted
Recognition Incentives → REC	0.030***	4.444			0.016	0.042	Accepted
Facilitators → SAT	0.015*	2.435			0.004	0.027	Accepted
Facilitators → DI	-0.004	0.692			-0.016	0.008	Non accepted
Facilitators → REC	0.018**	3.140			0.007	0.029	Accepted
Campaigns → SAT	0.039***	6.676			0.080	0.108	Accepted
Campaigns → DI	0.061***	8.306			0.047	0.075	Accepted
Campaigns → REC	0.094***	13.460			0.027	0.050	Accepted
H2 Extrinsic Motivations → Donors' Performance							
Obstacles → SAT	-0.096***	16.041			-0.108	-0.084	Accepted
Obstacles → DI	-0.045***	6.795			-0.059	-0.033	Accepted
Obstacles → REC	0.008	1.257			-0.004	0.019	Non accepted
H3 Obstacles → Donors' Performance							
Service Quality → SAT	0.516***	65.733			0.500	0.531	Accepted
Service Quality → DI	0.158***	17.453			0.141	0.176	Accepted
Service Quality → REC	0.118***	15.839			0.104	0.133	Accepted
H4 Service Quality → Donors' Performance							
H5 SAT → DI	0.167***	16.902			0.148	0.186	Accepted
H6 SAT → REC	0.049***	6.495			0.034	0.064	Accepted
H7 DI → REC	0.206***	28.839			0.192	0.220	Accepted
Satisfaction			0.306	0.303			
Donation Intention			0.112	0.077			
Recommendation			0.151	0.130			

Note: n = 10,000 subsamples; ***p-value < 0.001; **p-value < 0.01; *p-value < 0.05.

H3, while the rest of the hypotheses were accepted, as shown in Fig. 2.

5.3. Segmentation

Since the influence of factors analysed on the behaviour of active donors is not homogeneous, the second objective of this study is to identify different segments of active donors that justify a differentiated action strategy. This would allow blood transfusion centres to increase the degree of satisfaction, repetition, and recommendation in a more effective and efficient way.

Base on the values obtained by each of the participants for different latent variables in the model, as extracted through SmartPLS, a k-means clustering was performed with SPSS statistical software. Table 6 includes the results of this clustering and shows the centres of the 3 identified clusters. K-means is a non-hierarchical clustering analysis model which portions the data into a user-specified number of clusters, then iteratively reassigns observations (in this case, active donors) to clusters until some numerical criterion is met. This criterion aims to minimise the distance of observations from one another by creating a cluster and to maximise the distance between clusters [128].

Cluster 1, labelled ‘Fearful’, represented 18.0% of active donors. It was characterised for being the one with the highest obstacles, and those who give the greatest importance to the *recognition incentives*. This cluster is made up of individuals who are unwilling to increase their annual number of donations nor recommend blood donation to their colleagues. Cluster 2, labelled ‘Pure of heart’, was the largest (48.5%) and represents the donors with the highest degree of altruism (pure and impure) who are the most responsive to campaigns and urgent calls. In addition, they attach great importance to service quality and appreciate medical incentives. This cluster is the most willing to increase the annual number of donations and to recommend blood donation to others. This is the type of donor who is the most satisfied with the donation system. Finally, Cluster 3 was the second in size (33.5%) and was characterised by a strong emphasis on facilitators, as well as being satisfied donors who are willing to increase their annual number of donations or to at least maintain them. The foregoing, as long as it was easy for them to donate and there was a satisfactory level of service quality, suggested labelling this particular cluster as ‘Make it easy for me’.

Table 6

Construct	Cluster centroids ^a			F (p)
	Cluster 1 Fearful	Cluster 2 Pure of heart	Cluster 3 Make it easy for me	
Pure Altruism	-0.217	0.302	-0.321	1460.575 (0.000)
Impure Altruism	-0.106	0.533	-0.715	6903.450 (0.000)
Medical Incentives	0.163	0.600	-0.957	14500.591 (0.000)
Recognition Incentives	0.264	0.208	-0.444	1691.659 (0.000)
Facilitators	-0.736	0.084	0.273	2198.497 (0.000)
Campaigns	-0.073	0.432	-0.587	3996.521 (0.000)
Obstacles	0.594	-0.030	-0.275	1496.169 (0.000)
Service Quality	-1.310	0.340	0.211	9350.880 (0.000)
Satisfaction	-1.328	0.324	0.244	9692.493 (0.000)
Donation Intention	-0.894	0.287	0.064	3478.605 (0.000)
Recommendation	-0.645	0.346	-0.156	2513.285 (0.000)
Cluster size	5,503 (18.0%)	14,863 (48.5%)	10,253 (33.5%)	

^a Cluster centroids are the mean values of the observations (active donors) on the variables (the different categories) in the cluster variate.

To develop differentiated strategies, it is essential to know the profile and donation behaviour of each cluster. Table 7 and Table 8 show active donors’ sociodemographic characteristics and donation behaviour in each cluster, observing statistically significant differences among them. According to the *p-value* of the χ^2 statistic, all sociodemographic and donation behavioural characteristics were statistically significant (all *p-value* are less than 0.000), meaning that there were differences among clusters according to these values. However, among all variables

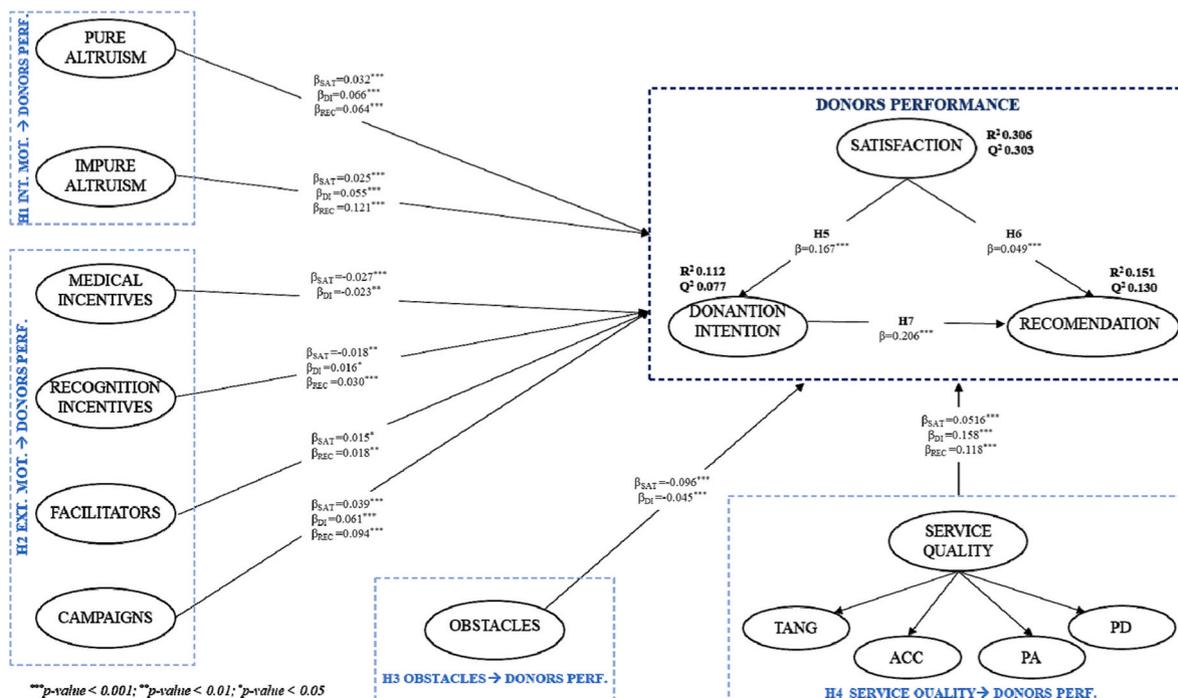


Fig. 2. Results of the proposed model.

Table 7
Cluster profiles according to sociodemographic characteristics.

Characteristics	Global		Cluster 1 Fearful		Cluster 2 Pure of Heart		Cluster 3 Make it easy for me		χ^2 (p)
	N	%	N	%	N	%	N	%	
Sex									
Male	14,464	47.2	2,637	47.9	6,851	46.1	4,976	48.5	15.715 (0.000)
Female	16,155	52.8	2,866	52.1	8,012	53.9	5,277	51.5	
Age (years)									
18–25	5,440	17.8	1,345	24.4	2,803	18.9	1,292	12.6	629.809 (0.000)
26–35	6,186	20.2	1,251	22.7	3,168	21.3	1,767	17.2	
36–45	8,336	27.2	1,404	25.5	3,988	26.8	2,944	28.7	
46–55	7,566	24.7	1,078	19.6	3,535	23.8	2,953	28.8	
>55	3,091	10.1	425	7.7	1,369	9.2	1,297	12.6	
Education									
No formal education or Primary	3,786	12.4	472	8.6	2,347	15.8	967	9.4	561.397 (0.000)
Secondary	10,972	35.8	1,909	34.7	5,741	38.6	3,322	32.4	
University	15,861	51.8	3,122	56.7	6,775	45.6	5,964	58.2	
University student									
Yes	4,810	15.7	1,169	21.2	2,357	15.9	1,284	12.5	206.112 (0.000)
No	25,809	84.3	4,334	78.8	12,506	84.1	8,969	87.5	
Employed									
Yes	23,750	77.6	4,120	74.9	11,313	76.1	8,317	81.1	115.323 (0.000)
No	6,869	22.4	1,383	25.1	3,550	23.9	1,936	18.9	
Total Monthly Income (euros)									
<1000	4,479	14.6	845	15.4	2,496	16.8	1,138	11.1	460.853 (0.000)
1001–2000	12,065	39.4	2,176	39.5	6,290	42.3	3,599	35.1	
2001–4000	10,931	35.7	1,924	35.0	4,826	32.5	4,181	40.8	
>4000	3,144	10.3	558	10.1	1,251	8.4	1,335	13.0	
Total	30,619	100.0	5,503	18.0	14,863	48.5	10,253	33.5	

Table 8
Cluster profiles according to donation behaviour.

Characteristics	Global		Cluster 1 Fearful		Cluster 2 Pure of Heart		Cluster 3 Make it easy for me		χ^2 (p)
	N	%	N	%	N	%	N	%	
Negative experience during a previous blood donation									
Yes	8,878	29.0	2,785	50.6	4,350	29.3	1,743	17.0	1,965.754 (0.000)
No	21,741	71.0	2,718	49.4	10,513	70.7	8,510	39.1	
Donation frequency in general									
Once	8,104	26.5	2,307	41.9	3,301	22.2	2,496	24.3	983.095 (0.000)
Twice	11,775	38.5	2,005	36.4	5,738	38.6	4,032	39.3	
3 or 4 times	10,740	35.0	1,191	21.6	5,824	39.2	3,725	36.3	
Usual place of donation									
Transfusion centre	5,921	19.3	758	12.8	2,898	19.5	2,265	22.1	236.544 (0.000)
Hospital or clinic	3,613	11.8	674	12.2	1,682	11.3	1,257	12.3	
Health centre	3,855	12.6	692	12.6	1,999	13.4	1,164	11.4	
Mobile unit	12,552	41.0	2,287	41.6	6,235	41.9	4,030	39.3	
Other places: work, study centre, community centre, etc.	4,678	15.3	1,092	19.8	2,049	13.8	1,537	15.0	
Experiences as a donor (years)									
<2	4,957	16.2	1,085	19.7	2,493	16.8	1,379	13.4	263.546 (0.000)
2–4	6,586	21.5	1,303	23.7	3,227	21.7	2,056	20.1	
5–10	7,604	24.8	1,395	25.3	3,734	25.1	2,475	24.1	
11–15	3,471	11.4	560	10.2	1,695	11.4	1,216	11.9	
>15	8,001	26.1	1,160	21.1	3,714	25.0	3,127	30.5	
Total	30,619	100.0	5,503	18.0	14,863	48.5	10,253	33.5	

analysed, the ‘Sex’ variable presented the lowest χ^2 value, which means that the differences among clusters were less pronounced, see [Table 7](#).

Regarding donation behaviour, statistically significant differences were also observed among clusters ([Table 8](#)). ‘Fearful’ cluster, 50.6% of individuals had a negative experience during a previous donation, which explains the pre-existence of obstacles to donating again. Thus, they are individuals who in general tend to donate only once a year (41.9%), mostly use mobile units (41.6%) and are the least experienced group as donors, since 43.4% of individuals have been in the system for less than four years (19.7% < 2 and 23.7% 2–4). The ‘Pure of Heart’ cluster is the one with the highest number of donations, where 39.2% of individuals donate 3 or 4 times a year, habitually use mobile units (41.9%) and 61.5% of the individuals in this cluster have been donors for more than 5 years (25.1% 5–10, 11.4% 11–15 and 25% > 15).

Finally, the ‘Make it easy for me’ cluster makes two donations per year (39.3%), and usually uses mobile units (39.3%), although it is also the group that uses the transfusion centre the most (22.1%). This is also the most experienced group with 66.5% of the individuals in the cluster having been in the system for more than 5 years (24.1% 5–10, 11.9% 11–15 and 30.5% > 15).

6. Discussion

6.1. Research findings

This study aims to bridge an important literature gap on donor attitudinal loyalty. The present research examines the role of motivations, obstacles, and service quality in experienced consumers: Active

blood donors. The results support most of the hypotheses formulated.

6.2. Theoretical implications

From SDL [129], the organization only make value propositions, but cannot create and/or deliver value independently; value is idiosyncratic, experiential, and determined by the beneficiary. The beneficiary, who is recognised as customer, would be a co-creator of value. Furthermore, from CDL [32], consumers choose the service offering or value proposition that best suits their ecosystem. However, based on Mulcahy et al. [8], this research recognises two types of customers in the blood donation: the customer-provider, who is the blood donor, and the customer-beneficiary, who is the blood recipient. It might be suggested that two distinct value propositions seem to emerge -value determined by the donor and value determined by the recipient of blood-, although it is imperative to create value for the donor in order to guarantee blood to the potential recipient. Blood donating is a service in which the ultimate goal of the service (e.g., getting blood to potential recipients) depends on excellent relationship management with the customers (donors). Based on Grönroos and Voima [32] and Mulcahy et al. [8], it is suggested that understanding the context of blood donor would be a critical challenge for maximizing the value proposition, and so that donation centres reach their transformative mission.

However, the act of donating is a singular process, where the donor does not receive a direct reward from the potential recipient; he/she simply donates blood for free to the health system [22]. Although there is no economic exchange as in the for-profit sector transactions, literature notes that there are multiple factors for donating beyond pure altruism [26,130] and costs of donating blood [15,26]. Based on Hupfer et al. [39], it is recognised that motivations and barriers are not conflicting factors, but rather correspond to different axes of a spectrum that influence the decision to donate. The effect of motivations and barriers on donor behaviour is complex as it also depends on the degree of donor experience or donor career (e.g., donors vs. non-donors, first-time and repeat donors) [13,57]. This research examined the simultaneous effect of motivations and barriers in active donors' future behaviour.

Once the decision to donate has been made, the donor is faced with the act of donating as a service encounter and which, based on Grönroos and Voima [32], would correspond to the joint sphere where the customer (donor) interacts with the service provider (donation centre). Literature also suggests that donation experience might influence perceived service quality, as Mohammed and Essel [13] point out. In addition, it is critical to analyse the donation process from a global perspective, including all the phases of the act of donating and the possible factors that may influence the donation behaviour [29,33]. In this regard, service quality scale used in the research model recognises different phases of donation process; for instance, accessibility (e.g., donation centre accessibility) or post-donation (e.g., ease of understanding the data from the analysis).

From an experienced donor base, this research has analysed how motivations, barriers, and service quality influence donor performance (satisfaction, donation intention, and recommendation). Findings demonstrate that the relationships were significant, although medical incentives and obstacles not influence recommendation. Facilitators also show a non-significant relationship with donation intention. Satisfaction would be influenced by motivations, barriers, and the perceived quality of the service, and therefore results from the evaluation of cognitive and emotional aspects, whether positive or negative. Based on Sánchez-Fernández and Iniesta-Bonillo [131], satisfaction might be considered as a proxy of perceived value. These findings demonstrate that it is required to simultaneously analyse motivations, barriers, and service experience quality to anticipate donor satisfaction and behavioural intentions. Regarding the influence of medical incentives and obstacles on recommendation, donors may be recognizing that these are highly personal judgments, not objective arguments, and therefore cannot be extrapolated to encourage or restrain the behaviour of others.

Facilitators, as extrinsic motivations that measure how successfully donation centres manage waiting and travelling times to collection points. In this regard, they may consider that they are hygiene factors, which must reach a minimum acceptable level and that only generate dissatisfaction if they do not meet this minimum level, as suggested by literature (e.g., Ref. [132]).

Data also revealed that the behaviour of active donors is not homogenous, and three segments of active donors were identified by a k-means clustering, which facilitated the analysis of simultaneous effects of different factors. Consequently, although service quality and customer satisfaction are basic premises for service success, as pointed out by Lemon and Verhoef [93]; it has different implications depending on the segment of donor. In the 'Fearful' cluster, a bad experience already negatively predisposes the donor to continue the relationship. In the 'Make it easy for me' cluster, donors expect a minimally satisfactory experience and are willing to continue the relationship if their opportunity costs are reduced. About 70% of donors in the 'Pure of heart' cluster report that they had no negative experiences with previous donations. They feel identified with the donation process and are therefore predisposed to recommend it. This cluster shows a higher frequency of donations, as Bednall et al. [38] note that donor experience improves behavioural intention because donors would have more realistic expectations, would be less susceptible to influence and tend to commit to donation as a habit. The research model also contributes to literature by analysing in the same model the individualised effect of motivations and obstacles to determine customised strategies. As derived from the literature (i.e., Ref. [59]), there is a need to identify the individualised influence of donor loyalty determinants. Donors in the 'Fearful' cluster are negatively sensitive to obstacles and positively sensitive to recognition incentives. Donors in the 'Pure of heart' cluster, as altruistic donors, are only positively affected by donation campaigns, urgent appeals and medical incentives. Donors in the 'Make it easy for me' cluster are particularly sensitive to facilitators, i.e., anything that makes it easier for them to donate.

According to the profile of each donor segment, donors in the 'Pure of heart' seem to perceive lesser costs than 'Make it easy for me' and 'Fearful'. 'Fearful' cluster perceives higher obstacles (e.g., physical distress or previous negative experience) demands higher service quality, and are lesser prone to donate again and recommend to others than other clusters. To a large extent, success with 'Make it easy for me' depends on facilitating the act of donating as easy as possible (e.g., reducing waiting times or improving the location of donation points). Thus, donors in 'Fearful' cluster perceive a higher opportunity cost of the act of donating and are more critical of the management of donation centres. From SDL [18], it would be more difficult for donation centres to design a value proposition that fits demand and overrides perceived barriers of donors in 'Fearful' cluster. As a consequence, they would be the donor segment that least ensures the stability of the health system as a whole. Therefore, from TRS in blood donation [8], this cluster would contribute less to the transformative mission of the blood donation system than 'Make it easy for me' and, particularly, 'Pure of heart' cluster.

Based on above, the donor experience seems to display an exponential relationship with each donation made, helping to reduce perceived barriers, and strengthening motivations, especially intrinsic ones.

6.3. Practical implications

To guarantee a secure and stable supply, it is necessary to design donors' retention strategies [13]. As literature suggests [58], it is necessary to create differentiated strategic programs, not only between donors and non-donors, but also among active donors.

Regarding to the practical implications of this work, donors in the 'Fearful' cluster, who show a more critical profile for the donation centre due to their low involvement, are prone to magnify obstacles. It is

important to identify perceived obstacles at each stage of the donation experience to create mechanisms that anticipate and discourage these obstacles. It would be advisable to provide personalised follow-up throughout the donation process, always showing empathy, and reinforcing the importance of donating both before and at the end of the donation. It is also advisable to train staff in clinical and psychological techniques to detect any adverse effects early and reduce the donor's anxiety and fear of a negative donation experience [38].

Regarding the 'Make it easy for me' cluster, donors are satisfied with the experience and willing to increase their donation frequency, provided that the donation is facilitated (e.g., appropriate location of donation venues) and that a satisfactory level of quality is achieved. As recommendations, these donors examine the opportunity cost of increasing their donation frequency versus the value of increasing their donation frequency. It is advisable to emphasise, particularly in service encounters, the social and public importance of donation, thanking them for their contribution before, during and after the process. Temporal accessibility should be maximised by extending donation time slots [58] and reducing waiting times in the donation process [133]. Also, it is advisable to improve geographical accessibility by increasing the number of donation centres, optimising their strategic location (shopping centres, main streets ...).

Finally, donors in the 'Pure of heart' cluster represents the ideal donor profile for donation centres, since they are altruist donors, highly involved in the service, and very likely to recommend. From TSR [9] and SDL [18], this cluster would represent the type of donor most predisposed to co-create value in the donation system and who contributes most to the transformative mission of the donation centres. They respond to the demand for donation campaigns and urgent appeals, value positively service quality and experience satisfaction and, in any case, welcome medical incentives. This type of donors would be great prescribers of the donation service and, as Martín-Santana and Beerli-Palacio [77] point out, it would be advisable to give them an active role in donation campaigns, testifying to their experience.

As a result, 'Fearful' cluster requires personalised follow-up throughout the donation process, trying to identify barriers to donation in order to manage them appropriately (e.g., by playing informative videos in the waiting room or asking control questions to screen for possible unexpressed fears). It is particularly important to assign the most experienced and best trained staff in social skills to the early stages of the donor's career. 'Make it easy for me' cluster demands, particularly, a better donation centres management, reducing opportunity costs, measured in waiting times and travelling inconvenience. On waiting time, it is suggested allocating more staff during peak hours, and schedule appointments so that more experienced donors, who require less attention time than first-time donors, are called on separate dates. Regarding travelling inconvenience, providing donation points near shopping malls, high streets, commercial and business areas, among others, would reduce perceived opportunity costs. On the other hand, 'Pure of heart' cluster might participate as prescribers during first-time donations. It is particularly relevant for the recruitment and retention of young people, who represent a segment of the population that could contribute to the continuous supply of blood needed by the healthcare system, as diverse authors point out (e.g., Refs. [53,134]), and thereby improve public welfare (transformative mission).

6.4. Limitations of the study and future research

The main limitations of the study, which also represent sources of ideas for future research, are presented below.

On the donor profile, in order to enhance the parsimony of the questionnaire, diverse variables and approaches were not included. Identity and personality might contribute to a better understanding the complex behaviour of blood donors, as suggested by White et al. [135]. As Ferguson et al. [40] note, it should be differentiated among 'donor identity' (why being a blood donor is part of the individual identity) as

'who the donor is' (characteristics of the donor). Identity and personality might reduce perceived costs for blood donating, and therefore it should be analysed. Secondly, blood donation is a prosocial behaviour, and individuals with a higher predisposition to contribute to the public good and experience in other types of prosocial activities might exhibit a singular behaviour pattern. For instance, diverse studies, such as Shehu et al. [136], aim to examine and compare time, money and blood donors. However, the prosocial experience and public motivation weren't measured in this research. Likewise, prosocial behaviour is not exempt from competition as individuals can choose from a variety of options (such as volunteering) to which to dedicate, for example, their time and effort [136,137]. Consequently, if the individual does not perceive sufficient value from his prosocial act, s/he may choose other types of activities aimed at public or social benefit or private interest. Recognizing the singularities of blood donation [136], it would be convenient to analyse optimal performance parameters in other types of prosocial services to identify and import effective and efficient practices to attract and retain donors.

On research context, this research has also analysed the frequency of donation, without differentiating the impact of abrupt events on the number of donations. In contrast to regular behavioural patterns in donors and non-donors, it would be important to examine in depth the impact of abrupt situations on the future behaviour of both segments, such as COVID-19 (e.g., Ref. [138]), or urgent blood calls for catastrophes (e.g., Ref. [139]). On the other hand, although findings provide literature with interesting data, the results were obtained from active donors who live in Spain, which is a developed economy whose blood donation system is well consolidated. Data may not be extrapolated to all geographic areas, and therefore a future line of research would be to validate the same in other geographical areas, particularly, developing economies (e.g., Ref. [140]). Also, the research model has addressed, mainly, multiple factors at micro-level, but examination of other variables from an ecosystem perspective might contribute to a better understanding of the success of transformative mission of blood donation systems. From an ecosystem approach [141,142], the negative impact of service encounters at the micro-level (e.g., act of donating) would have effects at other levels of the healthcare ecosystem, such as meso-level (a hospital with a deficit of blood for transfusion) and macro-level (healthcare system imbalance). As a result, there are other customers in the healthcare ecosystem; for example, hospitals would be internal customers of donation centres. Consequently, the blood donation system must create value propositions that meet the demands and needs of each of the stakeholders in the healthcare ecosystem with which it is directly or indirectly engaged. Furthermore, it is suggested a line of research on the relationships among different levels of healthcare ecosystem (macro-level and meso-level) and micro-level encounters at donation centres. As a reference, some findings on TSR [9] from an ecosystem perspective can be found in Finsterwalder et al. [143].

CRedit authorship contribution statement

Lorena Robaina-Calderín: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Josefa D. Martín-Santana:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Project administration, Funding acquisition. **Lucía Melián-Alzola:** Conceptualization, Writing – original draft, Writing – review & editing.

Data availability

Data will be made available on request.

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Appendix A. Final items

INTRINSIC MOTIVATIONS		
PURE ALTRUISM	PALT1	Fulfilling the social duty or moral obligation of helping other people
	PALT2	Donating blood requires no effort
	PALT3	Since blood cannot be artificially produced, we must all collaborate
	PALT4	Personal satisfaction derived from helping others
IMPURE ALTRUISM	IMPALT1	It can be good for my health
	IMPALT2	Donating blood makes me feel needed and useful to society
	IMPALT3	Perhaps I or one of my relatives might need blood in the future
EXTRINSIC MOTIVATIONS		
MEDICAL INCENTIVES	MEDINC1	Getting blood test results
	MEDINC2	Knowing if I have an infectious disease
	MEDINC3	Receiving medical advice about my health
RECOGNITAL INCENTIVES	RECINC1	Gaining the social recognition associated with being a regular donor (public events, diplomas, medals, certificates, etc.)
	RECINC2	Receiving symbolic gifts for donating blood (t-shirts, pins, towels, mugs, etc.)
	RECINC3	Receiving symbolic rewards for my history as a blood donor
FACILITATORS	FAC1	Appropriate location of donation venues
	FAC2	Waiting time less than half an hour
	FAC3	Duration of blood extraction process less than half an hour
CAMPAIGNS	CAMP1	An urgent call for blood donations
	CAMP2	Seeing or listening to an advertising campaign on TV, radio or social media
	CAMP3	Getting a call or message from a blood donation centre
	CAMP4	Hearing the testimony of people who have received a blood transfusion
OBSTACLES		
OBS1		Negative experience during a previous blood donation
OBS2		Lack of willingness, interest and/or motivation to donate blood
OBS3		Mistrust about the possible uses of blood
OBS4		Suffering physical distress (nausea, vomiting, dizziness, etc.)
OBS5		Suffering wounds in the arm due to use of needles (haematoma, irritation, etc.)
OBS6		Negative opinions of friends, relatives, etc., regarding blood donation
SERVICE QUALITY		
TANGIBILITY	TANG1	The facilities provide privacy during the interview and the blood donation procedure
	TANG2	The facilities are sufficiently clean
	TANG3	The facilities are cosy and comfortable
ACCESSIBILITY	ACC1	The donation centre or venue (either fixed or mobile) is accessible and easily available
	ACC2	Waiting time before blood collection is half an hour at most
	ACC3	The donation centres or venues' schedule is convenient
	ACC4	The duration of the donation process is convenient
PERSONAL ATTENTION AND PROFESSIONALISM	PA&P1	The staff performs well
	PA&P2	The staff always explains the requisites for donation, the donation procedure and gives recommendations for preventing any potential negative effects after blood donation
	PA&P3	Staff members are friendly and polite
	PA&P4	The staff looks after my well-being at all times
	PA&P5	The staff inspires confidence during the donation
	PA&P6	The staff answers my questions accurately
	PA&P7	At the end of the donation, the staff showed their gratitude to me
POST-DONATION	PD1	I get a thank-you letter or message after each donation
	PD2	The information sent to me from the analysis results is useful
	PD3	The information that I am sent from analysis results is easy to understand
SATISFACTION		
SAT1		How satisfied are you with your most recent blood donation?
DONATION INTENTION		
DI1		I am going to donate again in the next four months
DI2		I would like to become a regular donor (twice or more times a year)
RECOMMENDATION		
REC1		I encourage my relatives, friends and co-workers to donate blood
REC2		I discuss the positive aspects of blood donation among my relatives, friends and co-workers

Note: Readers may contact the authors to request a copy of the entire questionnaire designed and used by the authors as part of a national research project.

Appendix B. Pre-test stages of the questionnaire

1. The initial questionnaire was sent electronically in Word format to the collaborators so that the centre could assess the content of each of the scales used in the questionnaire to measure the different constructs included in the project. They were asked to include all appropriate suggestions in the same document.
2. A reminder call was made to the centres that had not sent in their suggestions one week after the submission. It was necessary to make this call to 9 of the participating centres.
3. Analysis of the suggestions received by the research team, detecting the need to make a telephone call in some cases in order to go into the reasons for the suggestions made in greater depth.
4. The final questionnaire was edited and the most relevant suggestions were the following:

- Add as usual place of donation the option 'Other places: workplace, study centre, community centre, city hall, etc.'
 - Elimination of the obstacle 'fear of contracting a disease'. The centres argue that in their campaigns they avoid any message suggesting that donation could imply contagion. It is a belief already removed from the minds of Spanish society that they do not wish to reawaken.
 - Modification of the facilitator 'Waiting times not too long' by 'Waiting time lower than half an hour'.
 - Modification of facilitator 'Duration of blood extraction process not too long' by 'Duration of blood extraction process lower than half an hour'.
 - Modification of the motivation 'If blood is not produced, we must all collaborate' by 'Since blood cannot be artificially produced, we must all collaborate'.
 - Modification of the medical incentive 'Getting the results of a full blood test' by 'Getting blood test results'.
 - Elimination of the incentive 'Participate in raffles for travel, electronic products, tickets to events, etc.' Most centres argued that the altruistic feeling of donation had been achieved among donors and they did not want this act to be commodified with high-value gifts.
 - Modification of the quality item 'Waiting time before blood collection is adequate' to 'Waiting time before blood collection is half an hour at most'.
5. A pre-test of the final questionnaire was carried out with a sample of 20 active donors to check that the items were written clearly and precisely, avoiding complex wording and syntax, as well as double-barrelled questions or words with multiple meanings. This pre-test was carried out in person and by members of the research team. At this stage the changes were minor and limited to changes of words to more colloquial ones and to simpler sentence structures.

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