

# Blood donation in Italy: a pedagogical study to educate young people to donate blood

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**Abstract:** Data on blood and plasma collection in Italy outline a national emergency: the age of donors is steadily increasing, and plasma collection is insufficient to cover the national need for immunoglobulins needed to treat rare diseases. Increasingly, people are forced to turn to the international market to purchase plasma-derived products where prices are continually rising. Systematic actions to recruit young periodic donors are therefore proving essential to ensure many more years of donation to the system and to promote healthy lifestyles and preventive health care in the population. Based on these thoughts, this research project investigates the socioeducational characteristics and motivations of the whole blood donor population and potential donors to intercept the personal, social, and cultural variables that influence the choice to donate and not to donate. Donor profiling and monitoring of blood donation choices and uses will be aimed at a later stage, at better targeting education and awareness campaigns regarding the benefits of plasmapheresis and blood donation.

**Keywords:** Educating on blood donation; young donors; health care.

## 1. Theoretical background and project goals

Humans are congenitally social animal born for the common good. It is precisely this other-oriented nature that spontaneously leads to supportive and supportive actions toward others. Solidarity, inherent in humanity contributes to the welfare of all citizens and is exercised in various ways such as, for example, charitable donations, crowdfunding collections, volunteering, social campaigns, long-distance adoptions, blood donations etc.

The research presented here precisely concerns the latter action-crucial to saving lives in emergencies and producing drugs for the treatment of rare diseases. We set out to isolate any dissimilar variables between blood donors and non-donors to offer insight into factors that might make a difference in the choice to donate.

In fact, for decades, health systems have faced a shortage of blood due to an imbalance between supply and demand (Carter et al., 2011). This shortage of blood donors and decline in young donors is an urgent global problem (Martín-Santana & Beerli-Palacio, 2012; Grant, 2010; Torrent-Sellens et al., 2021) caused by a variety of factors including an aging population.

In Italy, as shown by the National Blood Center's 2020 monitoring, the average



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age of donors is steadily increasing with a decline in those between 18 and 25 years old (about 200,000) and those from 25 to 45 years old, while those over 45 are increasing.

Even more worrisome are the data on plasma collection, which is essential to produce plasma-derived products used to treat rare diseases. A disease is defined as "rare" when its prevalence does not exceed a certain threshold, which for the European Union is set at 0.05 percent of the population (1:2 000)<sup>1</sup>. Despite the low prevalence of each disease, the total number of people affected by rare diseases in the EU is between 27 and 36 million and is constantly increasing (Serenelli S. et al., 2010). In Italy the collection of plasma by plasmapheresis i.e., a procedure of separating blood plasma from the corpuscular elements is not sufficient to cover the national need for plasma derivatives and is forced to resort to the international market where prices have increased due to the difficulty in collection. According to data released by the Italian National Blood Center, foreign market purchases of immunoglobulins (found in plasma) have increased by about 26 percent over the past 26 years. As proof, in 2021 blood donations totalled 3,021,143, of which only 455,000 were in apheresis.

Systematic and specific actions of recruiting and retaining volunteer donors therefore prove essential to ensure many more years of donation to the system by maintaining a constant blood supply. In addition, considering certain unsuitability criteria for blood donation (drug intake, alcoholism) and the free health check examinations reserved for active donors would reflexively promote a healthy lifestyle and preventive health in the population.

Such actions should make use of three complementary strategies: retaining active donors, attracting new donors, and recovering inactive and deferred donors (Godin et al., 2005). Intercepting and raising awareness of the donor pool takes place through outreach actions mainly by collection associations, intermediaries between donors and the national health care system. Awareness-raising actions are generally carried out through information campaigns, involvement, and retention of donors; the associations, in addition, provide call and donation scheduling actions in agreement with territorial transfusion facilities.

However, as the data indicate, these interventions are insufficient and need to be constantly renewed a sign, therefore, of a lack of social responsibility and activation and the persistence of a certain resistance or "laziness" to make a non-burdensome commitment, along with an individualistic attitude among potential donors, and possibly poor "education" on the value of donation.

Therefore, understanding the factors that motivate or deter people from donating blood is crucial to the development of blood donation and collection strategies (Bednall & Bove, 2011).

Based on these reflections, this research project proposes to investigate the socio-educational characteristics and motivations of the population of whole blood donors and potential donors to intercept the personal, social, and cultural variables that influence choice.

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<sup>1</sup> Source: [www.osservatoriomalattieare.it/malattie-rare](http://www.osservatoriomalattieare.it/malattie-rare)

## 2. Research instruments and results

The survey is conducted through the construction and administration of two online questionnaires with open and closed questions (one aimed at donors and the other at people who have never donated) that assume as variables to be explored: cultural level, social background, personal experiences, work style, reflective skills, empathy, and resilience. These variables will be translated into behavioral indicators that can be explored in descriptive form.

The questionnaire was completed by 267 non-donors and 97 donors aged 18 and older. The sample was predominantly female and of Italian nationality. The highest levels of education acquired by respondents are master's degree (44% non-donors, 30% donors) and secondary school (28% donors, 35% non-donors). Respondent's occupation is first teacher, then clerk, then student). Cities of residence are mostly in southern Italy, and respondents are in higher percentages-with differences of a few points between donors and non-donors-over 50 years old, between 38 and 41 years old, and between 22 and 25 years old.

We note an overlap of donors and non-donors in terms of cultural level and social background.

In the donor sample, it emerges that one is initiated into the practice of donation by personal choice (32 %), involvement of friends and relatives (20 %), and awareness at school and university (15 %).

The percentage of people (6.4 percent non-donors, 4.1 percent donors) who needed transfusions and/or plasma-derived medicines is minimal. However, if this experience is externalized in the social environment, the percentage goes up (65.5% non-donors, 60.8% donors). Few people also report problems with bleeding, anaemia, or other blood-related conditions in the family environment (22% non-donors, 18% donors,).

The sample of non-donors acknowledges that they are informed about the benefits of donation in 69.7 % of cases although this information is not incidental to their choice to donate - while in donors the percentage rises to 85.6 %.

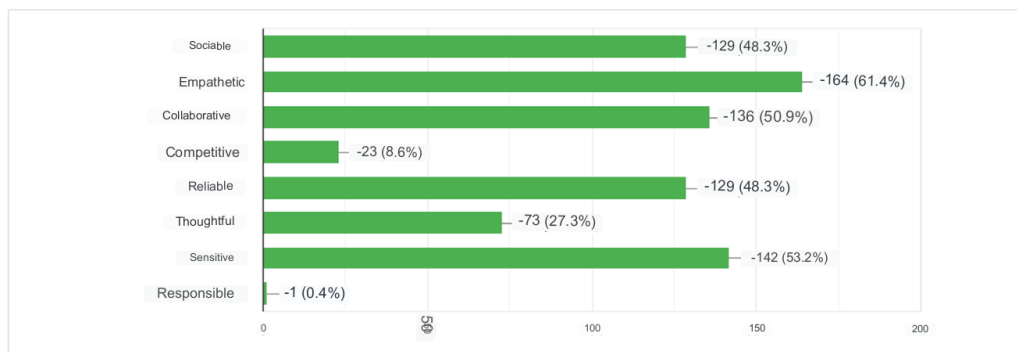
Both - with subtle percentage differences - say they received information, to a greater extent, from associations, online research, mass media, and scientific journals.

The pool of non-donors and uninformed donors about the benefits of donation reports, to a greater extent, that they have no information or have it assumed inadequately from online searches, mass media and scientific journals, and associations.

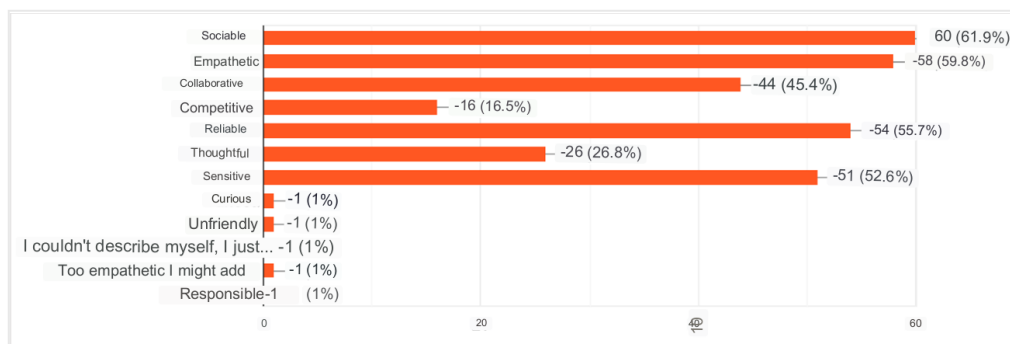
It is interesting to note that in the "non-donor" sample, the percentage of information from collection centres, hospitals, and physicians, compared to the "donor" sample, is markedly lower (6%).

Non-donors mostly describe themselves as empathetic (61.4 %), sensitive (53.2 %), and collaborative (50.9 %). (Figure 1). Donors describe themselves to a greater extent as sociable (61.9%), empathetic (59.8%), and reliable (55.7%) (Figure 2).

**Figure 1.** Adjectives used by "non-donor" sample for personal description



**Figure 2.** Adjectives used by "donor" sample for personal description



To all the questions about social competence i.e., introspection and reflection on one's own behaviours that are unconscious-harmful to others, concern for people even outside one's own social circle, involvement, and active participation in moments of crisis of a family member, knowing where to turn in a time of difficulty, the answers of the entire sample are mostly affirmative. All respondents also express a preference for cooperative work, and a propensity to give and receive help in times of difficulty.

Thus, an overlap of donors and non-donors also emerges in terms of personal experiences, working style, reflective skills, and empathy.

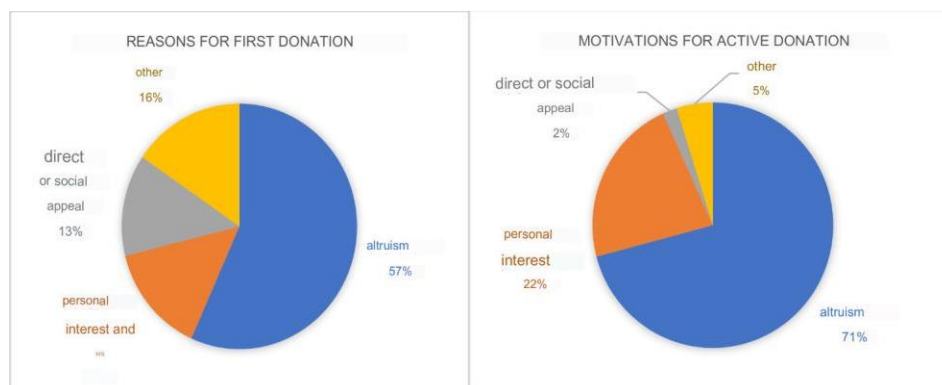
The factors that induce blood donation that were found in the exploratory survey are in line with the scientific literature (González et al., 2013), which divides them into three main groups:

- altruism, i.e., the desire to help others considered in most studies as the main motive (Ferguson, 2015; Guidi et al., 2015) reported by answers such as "to help others," "because it is important to donate," "to do something important for society," "because there is a need and therefore it is the right thing to do," etc.
- self-interest, i.e., gaining individual benefits such as, for example, economic or social recognition (Devine et al., 2007; Ferguson et al., 2008) signalled by responses such as "because I know it is good for my health," "to lose a day from

- work," "because I might need it myself someday," "to get a free checkup," "because it boosts my self-esteem or others' esteem of me," etc.
- direct or social appeal response, i.e., influence exerted by social reference groups such as friends, relatives, etc. or by marketing and awareness campaigns such as associations, schools, mass media, etc. (Glynn et al., 2002) reported by responses such as "to help a friend or relative," "because there was an accident and it was needed," "prompted by my father/by a friend," "after receiving information from the local association/school/college," "after seeing a report on TV/on the Internet," etc.

Specifically, in donor respondents, the motivations that prompted them to donate for the first time and the motivations that turn them off to repeat donation are primarily altruism (with percentages above 50%) and secondly, self-interest (Figure 3).

**Figure 3.** Motivations sample donation



The results, consistent with other international research (González et al., 2013), show altruism as the main motivation to donate for the first time (57 %) and to become an active donor (71 %).

Differences are noted, however, in the resilience responsiveness of donors versus non-donors.

The responses of the "non-donor" sample are slightly overwhelmingly (55.1%) positive about having feelings of overwhelm and failure and confirm the tendency sometimes (40.4%) to view events negatively. However, most of the sample (66.7%) say they can cope with unpleasant feelings. To the same questions, the "donor" sample responds to a greater extent with "sometimes" regarding overwhelm (42.3%) and disconfirms the tendency to view events negatively (45.4%). In line with this, a conspicuous majority compared to non-donors (75.3%) say they can cope with unpleasant feelings.

To test the hypothesis of a significant difference between the donor and non-donor sample about the resilience factor, Student's t-test was applied<sup>2</sup>(Table 1). Specifically, the responses to the three questions were converted into a numerical value (high resilience=2; medium resilience=1; low or no resilience=0) and the mode of the three values and, where not available, the median was considered. Proceeding

<sup>2</sup> <https://www.graphpad.com/>

with this analysis, the significance level (p-value) equals 0.0103, and therefore a statistically significant difference exists between the two groups.

**Table 1.** T-test resilience (mode/median) donors and non-donors

P value and statistical significance:	The two-tailed P value equals 0.0103	<b>By conventional criteria, this difference is considered to be statistically significant.</b>	
Confidence interval:	The mean of donors minus non-donors equals 0.22	95% confidence interval of this difference: From 0.05 to 0.39	Standard error of difference = 0,085
Intermediate values used n calculations:	t= 2.5778	df= 362	
Group	DONORS	NON-DONORS	
Mean	1.31	1.09	
SD	0.70	0.73	
SEM	0,07	0,04	
N	97	267	

It is reported that conducting the T-test on the individual questions regarding resilience, rather than on the mode and median values of the three overall questions, reveals among donors and non-donors a highly significant difference ( $t(362)= 3.3934$ ,  $p=.0008$ ) for the first question "Do you find yourself feeling overwhelmed and feeling like you can't cope? "; a not entirely statistically significant difference for the second question ( $t(362)= 1.9651$ ,  $p= .0502$ ) "In difficult times do you have a tendency to see everything black?" and a not statistically significant difference for the third question ( $t(362)= 1.3912$ ,  $p= .1650$ ) "Can you cope with unpleasant feelings?".

Thus, there is significant diversity between the resilience, i.e., the ability to cope and overcome difficulties, of donors and the resilience of non-donors with a higher average resilience for donors.

It was therefore investigated whether this ability could be associated with blood donation. Therefore, a numerical value was matched to being a donor (=2), being an occasional donor (=1), and not being a donor (=0). Subsequently, using the software Jamovi<sup>3</sup>, we proceeded to create the contingency table (Table 2) and carry out the  $\chi^2$  test of association (Table 3) by setting the significance level at .05. The test showed

<sup>3</sup> The jamovi project (2022). jamovi. (Version 2.3) [Computer Software]. Retrieved from <https://www.jamovi.org>. R Core Team (2021). R: A Language and environment for statistical computing. (Version 4.1) [Computer software]. Retrieved from <https://cran.r-project.org>. (R packages retrieved from MRAN snapshot 2022-01-01).



( $\chi^2(4) = 18.2, p = .001$ ) that is, greater than the theoretical value of 9.49 and the p-value is less than the set significance level. This means that the two variables can be considered dependent.

**Table 2.** Blood donation experience and resilience contingency table

Contingency Tables

		Mode/median resilience			Total
		Low resilience	Medium resilience	High resilience	
Blood donation experience		0	1	2	
Non-donors	0	51	103	54	208
Occasional donors	1	3	6	6	15
Donors	2	18	57	66	141
Total		72	166	126	364

**Table 3.** Test of association  $\chi^2$  blood donation experience and resilience

Test  $\chi^2$

	Value	dF	p
$\chi^2$	18.2	4	0.001
N	364		

It is reported that by conducting  $\chi^2$  association tests on the individual questions regarding resilience, rather than on the fashion and median values of the three overall questions, a statistically significant dependence ( $\chi^2(4) = 20.0, p < .001$ ) emerges between the variable's donation experience and resilience for the first question "Do you find yourself feeling overwhelmed and feeling like you can't cope? "; a statistically significant dependence ( $\chi^2(4) = 14.9, p = .005$ ) for the second question "In difficult times do you have a tendency to see everything black?" and a non-statistically significant dependence ( $\chi^2(4) = 2.35, p = .671$ ) for the third question "Can you cope with unpleasant feelings?"

Thus, resilience appears to be dependent on and associated with the blood donation experience.

### 3. Discussion

There is no gold standard on how to define or measure resilience (Windle et al., 2011; Calitz, 2018) as it is a complex multidimensional construct that has changed domain of meaning over time (Luthar et al., 2000).

It has shifted from a view of resilience as a stable trait throughout life (Werner, 1993; Block and Kremen, 1996), a personality trait, fixed over time and measurable (Connor and Davidson 2003), to understanding this skill as a "dynamic process that

includes positive adaptation in the context of significant adversity" (Luthar et al., 2000, p.543 ), a pathway that varies in different contexts, open to the possibility of change by the individual (Rutter, 2000), modifiable (Lohner and Aprea 2021), not simple construction, but re-construction that transforms negative experiences into opportunities to move forward and even master negative events so that one can emerge positively from them (Vanistendael and Lecomte 2000).

According to various authors (Tabibnia and Radecki, 2018; Nelson, 1999; Lerner et al., 2012) becoming resilient is related to neuroplasticity, and cognitive and behavioral pathways-even late in life (in adulthood)-can influence and increase resilience. Therefore, biopsychological foundations of resilience, are influenced by other factors such as circumstances, social context, timing of adverse events and experiences, as well as the individual's developmental history (Curtis and Cicchetti, 2003).

Noting then that one becomes resilient in life experience; from an evolutionary perspective we must assume that it is the experience of giving that increases the person's potential for resilience.

Also, looking at the similarity of psychosocial and educational variables in both samples (donors and non-donors), it can be assumed that what influences the choice not to donate are barriers, that is, obstacles to donation. Indeed, while multiple motivations contribute to the decision to donate, a single barrier blocks this choice altogether (Bednall & Bove, 2011). This results in the fact that most of the population does not donate blood, although they are willing to do so (Huis in 't Veld et al., 2019). Barriers include fear, lack of care from health care personnel, adverse physical reactions, length of the process, lack of time (Duboz & Cunéo, 2010), a bad experience, discomfort of donation sites (Schreiber et al., 2006), lack of information (Kalargirou et al., 2014), and lack of an explicit request to donate (Marantidou et al., 2007). All these obstacles can be divided into four categories (Romero-Domínguez, 2021):

- Informational barriers, i.e., related to lack of information (both access and continuity), awareness about the benefits of donation, the process, and how it works (locations, timing, requirements)
- Intrinsic barriers, i.e., related to internal processes, e.g., difficulty breaking down the wall of first time, beliefs, phobias such as needle phobia, etc.
- Spatio-temporal barriers related to donation such as lack of time, difficulty in reaching locations, low collection capillarity, limited donation appointments, etc.
- Procedural barriers, i.e., concerning aspects of the donation process itself and which may discourage donation frequency such as, for example, difficulty in the access process, too long waiting times, unpleasant environment, occurrence of adverse reactions etc.

These barriers decrease with increasing age (Charbonneau et al., 2016) and thus impact young donors. For this reason, blood centres, educational services, and associations in common agreement should analyze, in their own context of reference, the most frequent barriers to blood and blood component donation perceived by young people to direct actions that are not undifferentiated but aimed at their specific audience. Examples for breaking down some of these barriers and innovating the process for a youth audience could be advertising campaigns on social networks, information desks in school/university settings, digitized reminders and booking processes, the possibility of donating with a friend, entertainment (TV series, books, music) during the donation process, mobile medical clinics at school, university, and work sites, etc.



#### 4. Conclusion

In conclusion, the research, assuming that humans are naturally oriented to perform acts of solidarity and that the shortage of blood and plasma is a current and urgent social problem, set out to delineate the possible variables that affect the choice to donate.

The sample's responses to the web-based questionnaires revealed altruism as the main urge to donate and an adherence of donors and non-donors regarding cultural level, social background, personal experiences, work style, reflective skills, and empathy. The substantial difference that came out concerns the resilience responsiveness of donors compared to non-donors. This ability to cope with and overcome difficulties is higher in donors and is associated with blood donation experience. Noting, in fact, that this skill is dynamic and, based on experiences, can be increased during life, it was concluded that the donation experience leads people to increase their resilience.

Given such a coincidence of the donor and non-donor sample, it is proposed that blood collection associations investigate their specific pool in order to better target education and awareness campaigns regarding the benefits of blood donation and plasmapheresis and to focus, moreover, not only on the motivations for donating but also on obstacles and barriers-especially those perceived by the youth population-that contribute to blocking this choice altogether so that precise strategies can be developed that lead to greater social activation.

As a future line of research, the authors propose to increase the sample size and, at the same time, proceed with the dissemination of a revised version of the questionnaire among donation-eligible secondary school students (18-19 years old) to explore new variables such as fears, obstacles and donation preferences.

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