



The creation of a body donation program at Federal University of Juiz de Fora in Brazil: academic importance, challenges and donor profile

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Abstract: Dissection and human specimens study remain the gold standard method for teaching anatomy. Due to the increasing health science courses in Brazil, the traditional way of obtaining bodies for scientific purposes, the unclaimed ones, became insufficient. In addition, this source is no longer ethically appropriate according to anatomists. In order to maintain the teaching quality, the Federal University of Juiz de Fora (UFJF) in Brazil, inspired by successful initiatives around the world, created a body donation program; *Sempre Vivo*. Besides the bureaucratic difficulty faced during its regulation, the implementation of a body donation program requires special attention regarding the religiosity, culture and uniqueness of the city's inhabitants. Informing people can demystify the process, avoid prejudice and increase the number of donors. In this way, an outreach project was designed to publicize *Sempre Vivo* and raise public awareness. In the first six years, *Sempre Vivo* reached the mark of 64 registered donors and seven bodies received. The donor's profile corresponds to female (70.3%), 57 years of age, retired (50.8%), spiritist (53.1%) and with 12 years or more of formal education (90.6%). Considering that the UFJF has not received unclaimed bodies for ten years, the program was considered satisfactory up to this level and, in the future, it may be the exclusive source of anatomical specimens. The description of the creation and the publicizing of *Sempre Vivo*, the overcome challenges, as well as the donors' profile, may encourage and facilitate the foundation of similar programs in Brazil and abroad.

Key words: Body donation, Donors, Anatomy, Health education

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Introduction

Human anatomy is the science that studies the structures of the body in all its dimensions and complexities. Due to its relevance for the consolidation of knowledge in the Health sciences, anatomy has become indispensable to undergraduate courses [1-4]. Even with the advent of new methods of teaching in the 21st century, dissection and human speci-

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mens study remain the gold standard for the teaching of anatomy and it is established as a vital component to Health education, considering that it contributes significantly to the acquisition of essential clinical abilities and professional safety [5-8]. Dissabandara et al. [9] have reported that the majority of medical students have a positive perception of dissections. In addition, dissection may have an effect on course performance according to the student's opinion [10]. It is common knowledge among anatomy professors that the teaching of this science must rely on a prepared environment for students' learning, as well as integral anatomical specimens, which should be well-preserved and in a sufficient quantity for the number of students, and they must also provide trustworthy knowledge [11-13]. Besides that, studying using human specimens, alongside ethical education, stimulates respect to the body and sensibility of future healthcare professionals, providing a genuine understanding of the concept of death [14-17].

In Brazil, the regulation for obtaining cadavers for teaching institutions according to the norms of the public authority came to existence in 1992, when a law came into effect supporting the usage of unclaimed bodies within a 30-day period, with the aim of teaching and scientific research [18]. However, with the increasing number of medical schools and Health sciences courses, such a way became insufficient for maintaining an appropriate reserve of bodies at Universities, facing ever-increasing demands for bodies [19]. Furthermore, the development of information technologies has allowed easier identification of bodies, therefore restricting the number of unclaimed bodies addressed to higher education institutions [19].

In addition, although in many countries, including Brazil, the use of unclaimed bodies remains legal, anatomists do not consider this way ethically appropriate to obtain bodies for teaching and research [19, 20]. The International Federation of Associations of Anatomists (IFAA) recommended in 2012 that only donated bodies should be used for this purpose [21]. The use of unclaimed bodies and the bodies of executed persons was considered ethically controversial, since it uses bodies without consent. This practice was also criticized for discriminating against certain minority groups, such as criminals, poor, homeless people and individuals with mental illness [22, 23].

In this context, an alternative for the maintenance of an anatomical collection at Brazilian universities is to encourage voluntary donations of living donors, an already estab-

lished strategy in other countries [19, 24-27]. The creation of programs with this aim answers to the request of individuals who intend to donate their own bodies to research and studies, providing a legal resource to fulfill this wish [28, 29]. Brazilian law supports the body donation to teaching and research, for scientific or selfless purposes, since 2002 [18, 30].

Body donation is accountable for the totality of bodies obtained in Canada, Chile, the United Kingdom, Japan, and New Zealand, whereas in the United States, Uruguay, Portugal, Korea, and South Africa most of the cadavers used in anatomy laboratories are from donation [23, 27, 31, 32]. In Brazil, there are successful programs in capital cities, such as at the University of São Paulo and at the Federal University of Health Sciences of Porto Alegre (UFCSPA); in the latter institution, the program has been running successfully since 2008 and it currently supplies all the demand in undergraduation [19, 24]. Organizations working with a private supplier of anatomical material, as described by Wingfield in the United States of America cannot operate in Brazil [33].

The success of the aforementioned initiatives inspired the creation of a similar program at the Federal University of Juiz de Fora (UFJF). However, the implementation of an innovative body donation program in a city demands special attention regarding culture and uniqueness of its inhabitants, whose profiles are different from the ones found in other countries and places, such as large urban centers. The aim of this paper is to report the experience of the creation of the Program of Voluntary Body Donation for Teaching and Research; *Sempre Vivo* at UFJF and to describe the challenges encountered in the process and the alternatives to overcome them, as well as the profile of registered donors in the first years of operation.

Materials and Methods

Sempre Vivo program creation

Juiz de Fora is a non-capital city with a current population of 516,247 according to the 2010 demographic census [34]. The city has a 0.778 HDI (Human Development Index) and stands out in the educational sector. The UFJF and several private universities in Juiz de Fora make it a popular destination for students. UFJF held the 12th position among the Brazilian universities in the 2021 international ranking and some of its courses are considered among the best in Brazil [35].

In 2011, professors at the UFJF Department of Anatomy

stated that the acquisition of unclaimed bodies for teaching and scientific research had become insufficient for the maintenance of the institution's anatomical collection. There was a progressive decline in the acquisition of bodies connected to an increase in demands for anatomical specimens. In 2007, the Brazilian government allowed a larger number of spots and the creation of new Health courses at federal institutions, which significantly increased the number of students. In this context, it was imperative to find an alternative to keep human specimens available for the teaching of anatomy.

The voluntary body donation emerged as a possibility more suited to ethical principles and already been experienced by other universities [20, 36]. In this sense, a team was set up with professors and undergraduates from the Department of Anatomy, aiming to reach the theoretical frame required for the structure of a body donation program. Being so, the UFJF Department of Anatomy started organizing a body donation program *Sempre Vivo* based on a similar initiative of a Brazilian university located in a capital city—UFCSA—which was the main reference for the structure and operation of the program [19]. The IFAA guideline was fundamental to follow procedures of the highest ethical standards in order to give donors full confidence in their decision to donate [21].

In 2012, the team started fulfilling the necessary steps for the institutionalization of the program. During this process, *Sempre Vivo* was approved by different instances at UFJF, until it was regulated by the University in December 2013. The proceeding lasted for about two years due to the dif-

iculties in performing the bureaucratic procedures, which were very particular and unknown to the institution up to that point. In Brazil, despite the body donation having legal protection, the law is very broad and does not define the necessary procedures and documentation, as suggested by the IFAA, which represents challenges in implementing programs for this purpose [21]. Existing body donation programs are the benchmark for creating new ones [37]. Since then, considering this context, the team was also joined by law students and a bioethics specialized professor, responsible for the legal assistance of *Sempre Vivo*, making it a multidisciplinary program.

Raising public awareness of body donation

Once *Sempre Vivo* activities started in January 2014, an outreach project had to be created in order to publicize the program and to reach donors, since body donation still faces many challenges in Brazil and in the world [8]. The first is information; the majority of the population is unaware of the existence of this option and its benefits. Another factor is religious beliefs—most Brazilians follow doctrines in which the concept of death and attachment to the body does not encourage donation [34, 37]. In addition, in Brazil, the main way of obtaining bodies used for teaching and research is still the unclaimed [23, 37], usually linked to “forgotten” people, on the margins of society, who have no choice. This generates prejudice and makes it difficult for the dissemination of donation as a noble destination of the body [8], such as it occurs in the United States where body donation is considered a “gift” for teaching and research institutions [38].

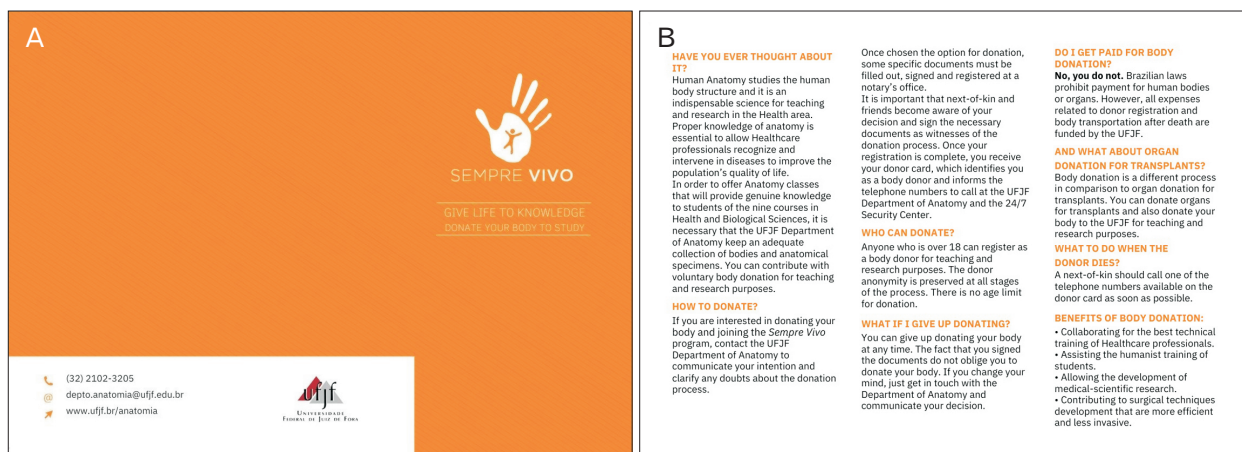


Fig. 1. *Sempre Vivo* information leaflet. (A) Cover: logo capturing the concept of donation associated with a publicity slogan: “Give life to knowledge, donate your body to study” and how to get in touch with the Department of Anatomy. (B) Inside: information about body donation.

In this context, the actions of the outreach project aim to maintain a permanent dialogue with the community to publicize the body donation as a real option, and of great importance for the qualified training of Health students. However, conflicts with faith and religious beliefs of individuals are always avoided. In addition, it is highlighted that the donation is a noble destination for the body, and also an altruistic attitude benefiting knowledge. Another objective is to make the academic and local community aware of the fact that body donation is the ethically correct option for maintaining the collection of the Universities [8], which need the participation of the population to preserve the quality of teaching. Currently, there are many legal questions about the use of unclaimed bodies [22, 39].

Since the beginning, the project included professors and undergraduates from the Department of Anatomy and a law professor as well as law students. All have contributed actively in all stages of planning and promotion. The first step of the awareness-raising strategy was the production of a logo associated with a slogan: “Give life to knowledge, donate your body to study” (Fig. 1). The *Sempre Vivo* logo consists

of an image of an open hand (related to the concept of donation) associated with a doll icon (a representative image of a body), with a clear message of valuing body donation.

The second step in the awareness-raising strategy was the online publicization, by showing the program on the Department of Anatomy website (<https://www.ufjf.br/anatomia/doacao-de-corpos-sempre-vivo/>) aiming to reach the general population of Juiz de Fora and nearby regions. Regular meetings to discuss the awareness process resulted in the production of an information leaflet and banners to clear communication and publicize the program (Fig. 1). This represented the third step, highlighting important information about body donation, its benefits and how to get in touch with the Department of Anatomy. Parallel to raising the awareness of the general public, specific actions were also developed for the academic community and healthcare professionals, who are the direct beneficiaries of *Sempre Vivo*, since the bodies obtained are used in its formation and improvement. The program started to be introduced through lectures to all pupils from the Department of Anatomy, a practice encouraged by the IFAA [21], stimulating them to replicate the goals of

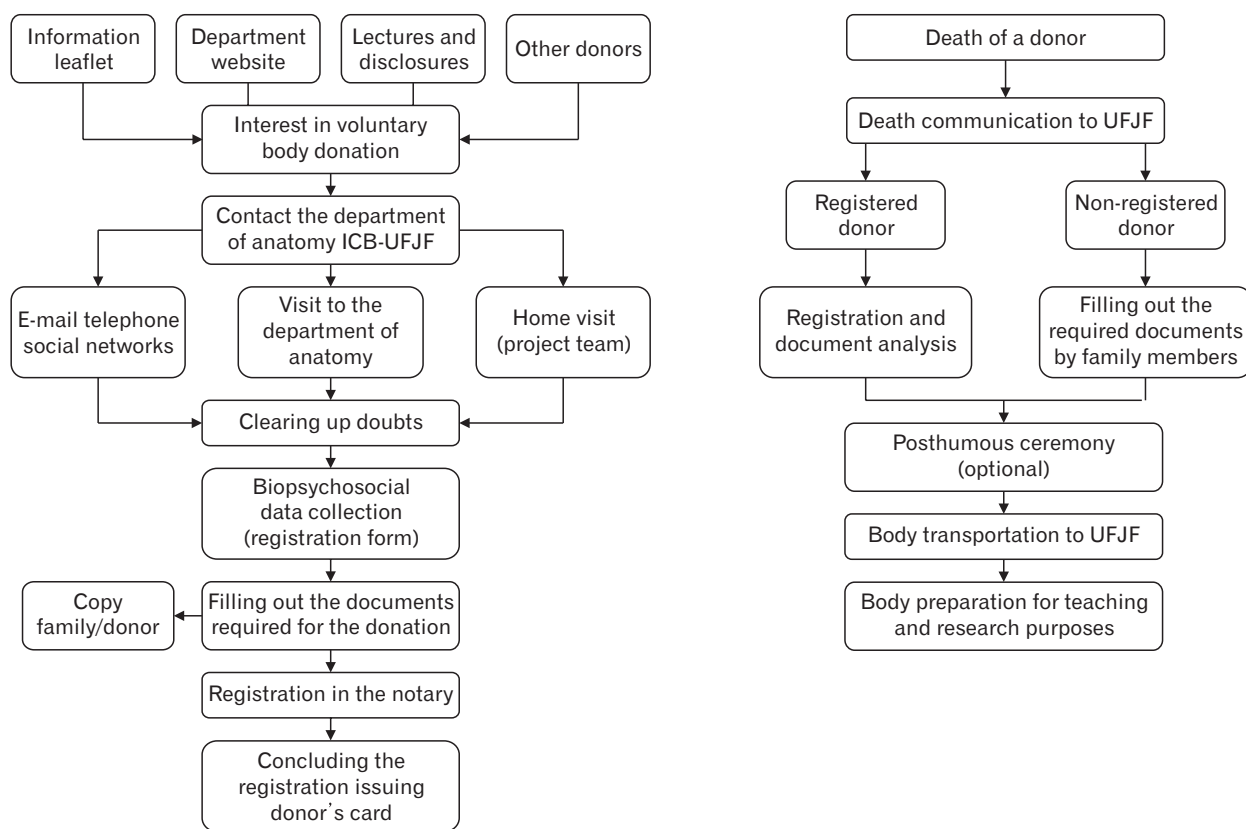


Fig. 2. Flowchart of *Sempre Vivo* since the donor's access to the program going through the registration procedures until receiving the body.

the donation to friends and family. Besides that, the *Sempre Vivo* was also promoted in medical and academic congresses, locally and nationally, offering increasing visibility to the program.

It is important to note that the pupils' participation alongside potential donors has positively impacted on the public awareness. On the other hand, the project has contributed to a broader and more qualified formation of the students involved by encouraging practical learning of teamwork, sharing responsibilities and developing ethical and communication skills.

Sempre Vivo program operability

As soon as the *Sempre Vivo* was publicized, people who were interested in donating started to look for the Department of Anatomy. Therefore, a flowchart (Fig. 2) of the procedures for assisting potential donors was created, aiming to standardize actions and certify that all the necessary information and documents were discussed in the process, according to the IFAA recommendations [21]. Right after the first contact with the Department, the potential donor was then invited to learn how the program works by visiting in person. At this moment, the *Sempre Vivo* team clears up all the donor's doubts and collects biopsychosocial data (registration form). Besides that, the team provides assistance for the correct filling-up of all documents, including consent form, as well as explains about legal procedures which are essential to conclude the application [19, 21]. The *Sempre Vivo* team encourages donors to discuss their intentions with their families [20]. In the course of the donor's registration in the program, the next of kin also signs the form, which is considered a good practice in body donation. Donor anonymity is preserved at every stage during the donation process [40, 41].

When it is unfeasible for the donor to go to UFJF, these first contact or general instructions can be performed at home (in which case the team goes to the home of the donor), by telephone or email. After the conclusion of the process, the person receives the *Sempre Vivo* card, which identifies them as a body donor, being instructed to always carry the card in case of eventful incidents.

If the donor decides to quit the program, he is instructed to get in touch with the Department of Anatomy in order to inform his decision, dismissing any other procedure or justification. After doing so, the registration is deleted from the database. In case the donor comes to pass away, the fam-

ily is oriented about the posthumous ceremony, as well as about the necessary procedures for the final transportation of the body to UFJF, with the exception of violent death (such as homicide, suicide and traffic accidents with a victim). In these cases, even if all the documents and forms for donation have been filled and registered in life, the body must remain under custody of the State for analysis and cannot be forwarded to the University [18].

The payment for human material is not ethically acceptable and it is also forbidden by Brazilian laws, so there were no rewards or perks provided to the donors [21, 30]. Body donation is an altruistic gesture, with no direct compensatory benefit to donors, but of great value for education and research in Health sciences. The family that chooses to perform the posthumous ceremonies has to cover the expenses. However, the maintenance costs of the bequest program, preparation and final transportation of the bodies to the Department of Anatomy are supplied by the UFJF.

The program intends to honor the donors by attaching a plaque with their names on the wall of the entrance of the UFJF Department of Anatomy as a special donor memorial. Only donors who have previously agreed to it will have their names on the plaque.

After the arrival of the donated body, the professors of the Department of Anatomy will jointly decide about the use of each body: practical laboratory classes with tutorials for identifying structures using bodies (offered to nine undergraduate courses in Health sciences and Biology); dissection training courses and development of medical-scientific research.

Results

Sempre Vivo results in six years of operation

The body bequest program *Sempre Vivo*, from the conception of the program until May 2020, reached the hallmark of 64 registered donors and seven bodies received (two bodies coming from after-death donation). It is important to emphasize that some members related to the *Sempre Vivo* have already been registered as donors, although registration is not mandatory for the program team participants.

Some studies have highlighted the fact that the donor profile varies according to the application site [36, 42-44]. The donor profile, specific to each donation program, is important in order to direct strategies to publicize it to the target audience and, consequently, provide positive results.

The donors' biopsychosocial data collected in the *Sempre Vivo* registration form were used to draw a profile of the program donors, considering parameters such as sex, age, how the donor came to know about the program, school education, current job situation, income, religious beliefs and faith. The study was approved by the UFJF Research Ethics Committee (no. 2.660.505).

The majority of registered donors are female (70.3%). The observed average age was 56.5±14.4 (SD) years. Among female, it was 53.9±14.2 (SD) years, with a minimum age of 19 years and maximum of 89 years. Among male, the average age was 62.7±13.1 years (SD), ranging from 33 to 91 years.

In relation to how the donors got to know about the *Sempre Vivo* program, 25.0% of them heard from other donors. The second most recurrent means was the website of the Department of Anatomy (18.8%), which represents a broadly used tool. The other means were less frequent (media, healthcare professionals, information leaflet, among others) as shown in Fig. 3A.

Most registered donors have an average formal education of 12 years or more, with only 9.4% having lesser education (Fig. 3B). Regarding the current job situation, 42.6% were active at the time of registration, 50.8% were retired, 3.3% were under government benefit and 3.3% under different circumstances. In this field, two registers did not contain information.

The information of the income was the following: 46.0% declared earning up to US \$600.00 per month, including donors with floating income; 38.1% stated they earn between US \$600.00 and US \$2,000.00 a month, and 15.9%, more than US \$2,000.00 monthly. In Brazil, the minimum wage in formal employment is R \$1,045.00 (approximately US \$200.00 a month).

Regarding religious beliefs and faith, more than half of the donors (53.1%) were Spiritist, 32.9% had other religious beliefs and 14.0% were self-proclaimed agnostic or atheists (Fig. 3C).

Considering the results of each year, there were no im-

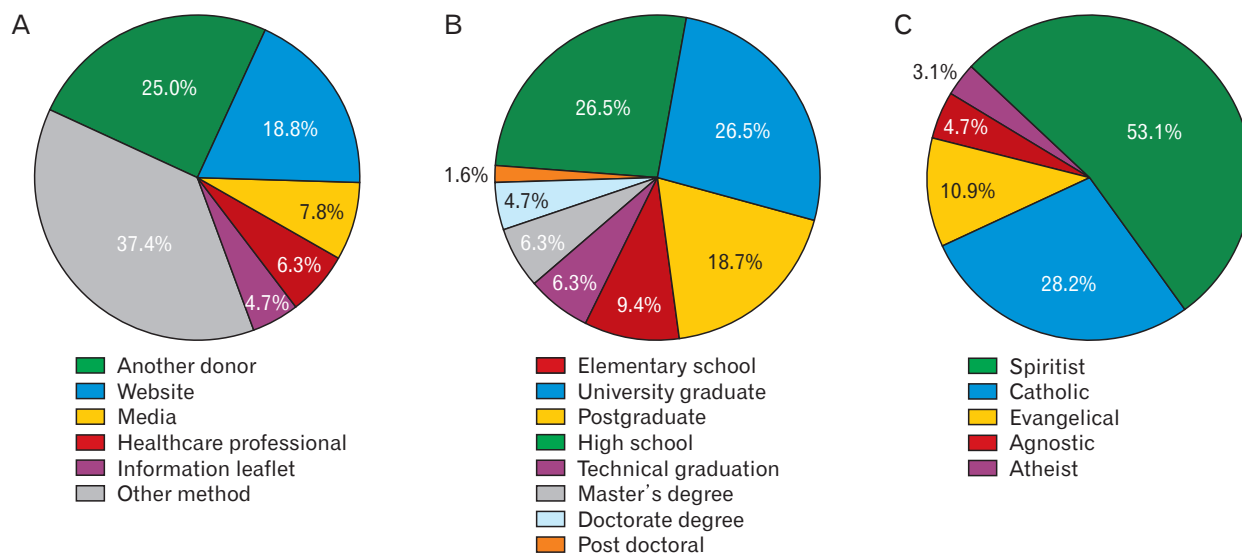


Fig. 3. *Sempre Vivo* donors profile, regarding (A) how the donor came to know the program; (B) educational level; (C) religious beliefs and faith.

Table 1. *Sempre Vivo* donor profile per year

Donor profile	Operating year					
	2014	2015	2016	2017	2018	2019
Age (yr)	57.5±13.0	50.8±12.5	55.6±17.4	51.8±7.8	66.4±11.4	58.4±13.9
Sex (male/female)	35.7/64.3	7.7/92.3	40.0/60.0	20.0/80.0	62.5/37.5	11.1/88.9
Program information*	23.1 (website)	30.8 (website)	33.3 (media)	80.0 (another donor)	25.0 (another donor)	44.4 (another donor)
Formal education*	92.3 (>12 years)	92.3 (>12 years)	93.3 (>12 years)	100 (>12 years)	87.5 (>12 years)	77.8 (>12 years)
Current job situation*	58.3 (retired)	66.7 (active)	60.0 (retired)	40.0 (retired)	50.0 (retired)	55.6 (retired)
Income per month*	46.2 (≤US \$600.00)	30.8 (≤US \$600.00)	46.7 (≤US \$600.00)	40.0 (≤US \$600.00)	50.0 (≤US \$600.00)	33.3 (≤US \$600.00)
Religious beliefs/faith*	38.5 (Spiritist)	61.5 (Spiritist)	46.7 (Spiritist)	80.0 (Spiritist)	50.0 (Spiritist)	55.6 (Spiritist)

Values are presented as mean±SD or %. *Most prevalent feature.

portant changes in the donor profile since the creation of the program. However, in the first three years, in relation to how donors got to know the *Sempre Vivo* program, the most recurrent mean was the website and the media. Since 2017, with the increase in the accumulated number of registered donors, the main mean became another donor (Table 1).

Discussion

The Department of Anatomy at UFJF attends nine undergraduate programs in the Health sciences and Biology, with a total of about two thousand students per year, which demands a high availability of bodies and anatomical specimens for study. Literature proves that the contact with natural specimens and the dissection of bodies contributes heavily to the development of ethical and clinical skills which are essential for healthcare professionals, since this is, possibly, the first contact for most students with death [1, 2, 6, 7, 17]. This experience promotes reflection regarding death, selflessness, respect and generosity, contributing for the personal development of the students, as well as for a humanized professional formation [8, 11, 13, 14].

Traditionally, UFJF receives unclaimed bodies, and its availability has been decreasing progressively throughout the years. Considering that the last arrival of unclaimed bodies predates 2010, the alternative to preserve the supply of bodies was to create a program for voluntary body donation. In addition, with the publication of the IFAA guidelines in 2012, body donation has been highly encouraged, mainly for ethical reasons, and programs have emerged in many cities in different countries [21]. *Sempre Vivo* started operating in 2014, following the recommendations of good practices towards body donation, in a peculiar scenario. Juiz de Fora differs from the capital cities and large urban centers, where the

main bequest programs in operation in Brazil are located. In this context, it was essential for the team to elaborate an outreach project to raise awareness among potential donors. The Department of Anatomy considers the program satisfactory up to this level and believes that body donation is a feasible alternative and, at the moment, it is the main source for the maintenance of the reserve of bodies at the Institution.

The relevance of donation programs to supply demands of bodies and anatomical specimens to teaching institutions in different countries and regions worldwide is widely evident and validates the current findings [13, 27, 44-46]. At the University of Otago, in New Zealand, the bequest program of the School of Medical Science has been active since 1943, with more than 140 annual registers in the last decades, and also with an approximate reception of 3,000 bodies [45]. In Poland, the donation program at the University of Silesia, in Katowice, counts with approximately 1,250 registered donors since its creation, in 2003 [44]. At the University of Bologna, in Italy, the authors observed an increase from 12 to 431 living donors between the creation of its bequest program in 2013 and the first trimester of 2020 [13]. The number of body donations in Korea increased from 7 to 128 annually at the Yonsei University College of Medicine between 1992 and 2019, reaching a total of 2415 donors [27]. In Brazil, the UF-CSPA used to receive about 5 donors registers a year. After the creation of a body donation program, in 2008, this number increased to more than 29 annual registers [19]. Table 2 summarizes the donation programs discussed and shows that the number of annual donor registers is higher in older bequest programs and in more populated regions. In Brazil, UFSCPA's body donation program has three times more annual donor registers than *Sempre Vivo*, but the population of the city of Porto Alegre is around three times larger. In addition, the UFSCPA's program has been in operation for approximately 12 years [34, 19].

On the other hand, unclaimed bodies are still widely used worldwide, including in Brazil. In some countries, it remains the exclusive source of bodies for teaching and research [23]. Since this practice was considered ethically controversial, many anatomists find themselves in a complicated work situation. New discussions addressing this current condition need to occur in the international scientific community, considering the limitations of different realities [20, 41].

Regarding the profile of the donors registered on *Sempre Vivo*, the females are predominant: they correspond to 70.3%, which is higher than the sex difference observed in

Table 2. Summary of the body donation programs discussed above, highlighting the year of foundation and the number of registered donors per year

University (country)	Foundation of the bequest program (yr)	Donor registers (yr)
University of Otago (New Zealand)	1943	>140
Yonsei University College of Medicine (Korea)	1992	>128
University of Silesia (Poland)	2003	>113
University of Bologna (Italy)	2013	>61
Federal University of Health Sciences of Porto Alegre (Brazil)	2008	>29
Federal University of Juiz de Fora (Brazil)	2014	>10

Brazil, where 51.7% of its inhabitants are female [34]. Similar results were found by Bajor et al. [44] in Poland, by Cornwall et al. [25] in New Zealand, and by Orsini et al. [13] in Italy. In addition, Cornwall et al. [36] showed that in countries like South Africa, Ireland, and New Zealand, female correspond to most of the donors, but they do not differ from the rates that characterize the general population. On the other hand, some studies have registered a very similar proportion between sexes of the donors [42, 47].

The average age of registered donors is approximately 57 years old, which agrees with other studies that present similar results. Orsini et al. [13] found an average age of 59.1 years among registered donors in the University of Bologna, in Italy. In Ireland, the average age registered was around 60 years old; according to the authors, the use of the internet as a means of publicizing the body donation program resulted in a much higher number of younger donors [36]. An important means of accessing *Sempre Vivo* is the website of the Department of Anatomy, which may partly justify the average age among registered profiles. On the other hand, Park et al. [27] have found a gradual increase in the average age for body donation over 28 years of their bequest program. Jedrzejewski and Ritter [47] found a higher average age, around 82 years, in Rhode Island, USA, which may be associated with a higher life expectancy of the local population [48]. Several studies around the world have also identified a higher average age among donors [25, 27, 42-44]. According to da Rocha et al. [37], this age characteristic might be related to the fact that people over 60 years of age are more likely to consider death and the fate of their bodies.

In addition, the fact that the main way to know *Sempre Vivo* is through other donors might be associated with efficient and clarifying service to the potential donors and the credibility of the program. The body donation to teaching and research institutions must be carried out according to ethical principles. Transparency in the procedures for donating and handling the body is important for the donor safety, increasing the society contribution and the number of donations. Informed consent and recommendations on the non-commercialization of the body are principles that should guide the body donation [8, 20, 21, 27].

Regarding the level of study among donors, previous studies have shown that individuals associated with donation programs presented a level of formal education of approximately 12 years of study [36, 42, 44]. Most donors of *Sempre Vivo* presented 12 years or more of formal instruc-

tion, supporting this information. This fact might be related to the quality and source of information that the people with a higher education can have access to. In Turkey, the amount of donated bodies meets the need of educational institutions in cities with high educational levels [26]. Furthermore, several researchers reported that body donors tend to have higher educational levels than respective populations [36, 42, 49, 50]. A study performed in Spain with 2,000 people analyzed the factors that would be associated with organ donation, a very similar scenario. The results have demonstrated that media like television and radio are the ones which allow a wider spread of the information to the population, but a superficial and simplistic approach to the theme does not favor the numbers of people favorable to the donations. In contrast, people with a higher level of education are also exposed to the theme within their institutions, in which organ donation is approached at a deeper level and they are given space for asking questions, which favors acceptance [51]. It is plausible that these considerations can also be applied to body donation, which reinforces the importance of informing donors, and that is already developed in *Sempre Vivo*. Aiming at reaching the academic and scientific community, educational lectures about body donation are performed for every anatomy student, and the program is published in scientific events, locally and nationally.

In addition, regarding the current job situation of registered donors, the results of *Sempre Vivo* are similar to those found by Bajor et al. [44] in Poland, where 68% of all the people registered in the donation program are also retired. Alternatively, McClea and Stringer [43] demonstrated that, in New Zealand, even though the majority of the population is above 60 years old, there is an increasing participation of donors in the active labor market. This characteristic might be associated with an increase of life expectancy around the world in the last decades, as well as with the need of adjustment of retirement systems in several countries, lengthening the workers' activities [43, 52].

Furthermore, the income profile of *Sempre Vivo* donors is similar to the Brazilian population profile of income, according to data from the Brazilian Institute of Geography and Statistics: 42.5% earn up to US \$600.00 monthly, 44.5% between US \$600.00 and \$ 2,000.00, and 13.0% more than US \$2,000.00 per month [34]. This profile is corroborated by da Rocha et al. [37] in a major urban center in Brazil. Researchers in other developing countries found a similar result. In Turkey, for instance, the majority of registered donors (39.3%)

had a monthly income between 1,000 and 2,000 TL (approximately US \$127–254), while in Thailand 42.8% of the donors had a monthly income between 10,000 and 30,000 Baht (approximately US \$320–960) [50, 53].

Regarding religion, the current program has noticed that one in two donors to *Sempre Vivo* is a declared Spiritist. Therefore, Spiritism is the most present religious belief among donors, which differs from the national religious profile. According to the 2010 census, only 2% of the Brazilian population declared themselves to be Spiritists, while in Juiz de Fora, considered as a reference of this religious belief, 5.4% of the citizens are adept to Spiritism. In addition, da Rocha et al. [37] assessed the donor profile of a specific region of Brazil where Catholicism predominates with 68.4% of the population and only 3.6% is Spiritualist, but 30.2% of the donors sample evaluated declared themselves Spiritualist, reinforcing the findings of this study. According to Gunderman [54], donating your own body for research and teaching shows great selflessness for the benefit of others. In this context, it is possible then that Spiritism is associated with a higher tendency of body donation, for it is a reincarnationist doctrine that preaches selflessness, dissociation of the body and detachment of the matter [46, 55]. Other doctrines that also preach the existence of life after death and that the body is only a temporary shelter to the spirit also favor voluntary body donation. In countries where Buddhism is predominant, for example, programs refuse bodies for not having any more physical space [46]. In Korea, the contact of its citizens with the Western culture has reduced the dominance of Confucianism, in which it rejects any form of unnatural disturbance to the body, increasing the number of donors [27, 55]. In Turkey, an interesting finding of Gürses et al. [53] was that religion is both a positive and negative motivational factor, and they argued that given Turkey's different and diverse religions, differences at the donor's profile are also expected.

However, while some religions such as Spiritism make body donation desirable and comfortable for their followers, this decision does not need to be considered contrary to other types of faith and religious beliefs [46, 55]. The information can demystify the process, show its importance and increase the number of donors from different religions. This reinforces the need for actions to clarify and raise awareness among the population, which was decisive for the *Sempre Vivo* team to elaborate an outreach project with this objective [8]. Although Juiz de Fora has a larger Spiritist population than other locations in Brazil, this percentage is still

very small compared to other religions [34].

The collected data suggest that the prevailing profile among donors for *Sempre Vivo* is a woman, with higher education, with an average age around of 60 years, and also a declared Spiritist. Some of these traits are not usually found in other body donation programs, and this highlights the fact that the donor profile varies according to their place of application [36, 42-44]. The city of Juiz de Fora presents unique characteristics that might have influenced the implementation and operation of the *Sempre Vivo* program.

The challenges of creating a body donation program are numerous, but the results are worth it. Some important suggestions can help the process. First, to form a team of human anatomy professors and students who value the body donation for teaching and research. Second, to deeply study the ethical principles involved in body donation; thirdly, to access all information about the legislation that regulates the body donation at the location of the program creation; fourthly, to take advantage of the experience of bequest programs already operating in the host country and abroad; fifthly, to develop a population raising-awareness strategy based on the specific characteristics of their citizens. Furthermore, once the program has been created, it is worthwhile, as soon as possible, to profile the donor and modify the publicization strategy if necessary.

Lastly, there are some limitations in this study, which include the currently short running time of the program and its application in a single university, which restricts the sample numerically. Broader studies, with a larger longitudinal reach, may complement the data and allow this experience to be more faithfully foretold in other contexts. However, in the UFJF scenario, *Sempre Vivo* is considered an adequate and promising program according to the academic community and the Institution's administration. In the future, it may be the exclusive source of the University reserve of bodies and anatomical specimens.

In conclusion, considering that the UFJF Department of Anatomy has not received unclaimed bodies for ten years and *Sempre Vivo* has allowed the arrival of seven bodies in six years, body donation represents a viable and ethically desirable alternative for maintaining the supply of anatomical specimens at higher education institutions.

The description of the creation and the publicizing of *Sempre Vivo*, the challenges encountered in the process and the alternatives to overcome them, as well as the donors' profile, may encourage and facilitate the foundation of new

similar programs in other teaching and research Institutions, both in Brazil and abroad.

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Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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