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Practical analysis of the impact of social marketing strategies on attitudes of potential reproductive cell donors in the Republic of Serbia

Praktična analiza uticaja strategija socijalnog marketinga na stavove potencijalnih donora reproduktivnih ćelija u Republici Srbiji

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Abstract

Background/Aim. There is a constant increase in the need to use third-party reproductive cells among couples who are unable to conceive with their own reproductive cells or in order to prevent the passing of an existing hereditary genetic disorder to the child. The aim of the study was to present a theoretical overview and perform a practical analysis of the use of social marketing strategies using the first technique of analyzing the attitudes of potential donors of reproductive cells in the Republic of Serbia (RS) in the interest of adapting to the target group. **Methods.** Empirical research in this study, in which both women and men from the RS participated, was based on a questionnaire about people's willingness to be potential reproductive cell donors and about having information on the donation of reproductive cells. The data in this paper were obtained during 2021, and the questionnaire was focused on a particular population group. The questionnaire was sent to people aged 20 to 34 years who could become potential donors of reproductive cells. In the research, 201 women and men from the RS participated. The first part of the questionnaire was tested for internal consistency, which was tested by Cronbach's alpha coefficient calculation (α). Values of α lower than 0.5 indicate that the questionnaire possesses unacceptable consistency. **Results.** A total of 57% of participants were informed about reproductive cell donation through the Internet, 29% by friends and family, and 11% of them were informed by doctors. Only 32% of participants were fully informed, and 25.1% were partially informed about the donation of reproductive material in the RS. Forty-three percent of participants were not informed about the donation of reproductive material. Most of the participants (54%) said they would maybe donate their reproductive material if they had more information, 20% would donate in any case, and 26% would refuse to donate reproductive material. **Conclusion.** The target group of potential donors of reproductive cells is present in the RS. In addition to the analysis of attitudes, further planning and implementation measures for the promotion of donation could have an influence on raising awareness about the lack of reproductive material and increase the recruitment of gamete donors.

Key words:
directed tissue donation; humans; reproduction; serbia; social marketing.

Apstrakt

Uvod/Cilj. Postoji konstantni porast potrebe za korišćenjem reproduktivnih ćelija trećih lica kod parova koji nemaju mogućnost začeća sa sopstvenim reproduktivnim ćelijama ili da bi se sprečilo prenošenje postojećeg naslednog genetskog poremećaja na dete. Cilj rada bio je da se teorijski prikaže i praktično analizira upotreba strategija socijalnog marketinga, korišćenjem prve tehnike analize stavova potencijalnih donora reproduktivnih ćelija u Republici Srbiji (RS), u interesu prilagođavanja ciljnoj grupi. **Metode**. Empirijsko istraživanje, u kome su učestvovale i žene i muškarci u RS, bilo je zasnovano na upitniku o spremnosti osoba da budu potencijalni donori reproduktivnih ćelija i o posedovanju informacija o donaciji reproduktivnih ćelija. U radu su podaci dobijeni tokom 2021. godine i upitnik je bio fokusiran na posebnu grupu stanovništva. Upitnik je poslat osobama životnog doba od 20 do 34 godine, koje bi mogle biti potencijalni davaoci reproduktivnih ćelija. U istraživanju je učestvovala 201 osoba ženskog i muškog pola, u RS. Prvi deo upitnika testiran je na internu konzistentnost, koja je testirana Kronbahovim proračunom alfa koeficijenta (α). Vrednosti α niže od 0,5 ukazuju na to da upitnik poseduje neprihvatljivu konzistentnost. **Rezultati.** Ukupno 57% ispitanika bilo je informisano o doniranju reproduktivnih ćelija putem

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interneta, 29% od strane prijatelja i porodice, a 11% je obavestio lekar. Samo 32% učesnika bilo je potpuno informisano, a 25,1% delimično informisano o donaciji reproduktivnog materijala u RS, dok 43% učesnika nije bilo obavešteno o donaciji reproduktivnog materijala. Većina učesnika, njih 54%, izjasnilo se da bi možda doniralo svoj reproduktivni material ukoliko bi imali više informacija, 20% bi doniralo u svakom slučaju, a 26% bi odbilo donaciju reproduktivnog materijala. **Zaključak**. Ciljna grupa potencijalnih davaoca reproduktivnih ćelija prisutna je u RS. Pored analize stavova, dalje planiranje implementacije mera za promociju doniranja moglo bi uticati na podizanje svesti o nedostatku reproduktivnog materijala i povećati odziv davaoca gameta.

Ključne reči:
tkivo, usmerena donacija; ljudi; reprodukcija; srbija; marketing, socijalni.

Introduction

Reproductive cell (gamete) donations are part of the infertility treatment with third-party assisted reproduction in which one of the partners is not a biological parent (sperm/oocyte donations) or both partners are not biological parents (embryo donation of newly created donated reproductive cells). The third party will not be involved in raising the child but agrees to donate their genetic material for reproductive purposes. Medical indications for using third-party reproductive cells are the inability to conceive with one's own reproductive cells, the lack of one's own reproductive cells, or an inherited genetic disease in order to prevent passing the disorder to the child. Therefore, reproductive cell donation is a health need that leads to the successful treatment of patients for whom it is the only form of infertility treatment. To recruit donors, it is necessary to educate the public about the concept of donations as well as about the possibility of donating reproductive material in the Republic of Serbia (RS). This would fill the reproductive cell bank. Information strategies include promotional campaigns that would shape the attitudes and decisions of potential donors.

In many European countries, there are not enough donors of reproductive cells; thus, recruitment is reduced, especially for egg donors. Even though media campaigns are launched to raise awareness in some countries, recruitment is reduced, and the shortage of reproductive cell donors is still present. Moreover, every year the number of recipients increases [mostly middle-aged (45–64 years) women], so there is a growing gap between supply and demand [1]. Data from the European Society for Human Reproduction and Embryology for 2011 show that there were 64,270 donations (egg donation and donor semen insemination) [2], while for 2016, that number almost doubled to 113,513 donations (egg donation and donor semen insemination) [3].

The procedure itself varies from one country to another due to legislative policies that regulate and guide organizational practice. A total of 30 countries offer treatments to single women, the use of donated sperm is allowed in 41 countries, and egg donation in 38 countries. The number of infants originating from the same sperm donor is different. This number ranges from one in Cyprus to 25 in the Netherlands. In seven out of 30 countries, the maximal number of families/women that may have children from the same sperm donor ranges from two in Slovenia to 12 in Denmark. The maximum number of infants originating from the same egg donor is defined in 25 countries, and the most common numbers are between four and six [4]. The first documented donor sperm insemination was performed in 1884 at Jefferson Medical College in the USA, while the first reported live birth from a donor egg occurred in Australia in 1983, quickly followed by another one in California in that same year [5].

Social marketing is a discipline that serves to influence the change of social behavior through research using social marketing methods and thus tries to solve social problems and participate in raising awareness about social dilemmas [6].

Social marketing uses marketing approaches like social marketing research and analysis for implementation and control of the implementation of social marketing strategies [6]. According to data from the updated publication of the Health Promotion Glossary of Terms 2021 published by the World Health Organization (WHO), the role of social marketing is to develop and integrate levels and concepts of marketing and thus influence behaviors that benefit individuals and communities. The practice of social marketing integrates research, practice, and theory and provides information on possible social change programs that are effective, efficient, equitable, and sustainable. It also includes creating a plan and implementing and controlling programs aimed at increasing the acceptability of social ideas and practices among target users. Social marketing methodologies are used for health communication and education in all countries [7].

A socially responsible approach is part of social marketing strategies. The first step in the implementation of social marketing strategies is the analysis of social problems through all aspects and with information that researchers could get and complete. The second step is to define social marketing strategies. The following steps are the implementation of marketing strategies and control of results in solving social problems. The goals of social marketing strategies are to raise awareness about social problems and define social marketing strategies in order to implement them. The final goal is to evaluate the results of solving social marketing problems, according to Wood [8].

Donor recruitment can be done on a reciprocal basis. A system built according to the rule of reciprocity where people who voluntarily accept they will benefit from the system should, therefore, contribute to that system as much as it is in accordance with their capacities. That is the so-called mirror gamete donation which can be achieved by setting up a system in which the partner of an infertile person donates gametes (as done in the Netherlands, Italy, France) [1].

The method of donor recruitment can be relational. In France, there is another principle of gamete donation – soli-

darity. Originally, there was the idea that a couple who has already got a child went to the French National Germ Cell Biobank (CECOS – *Centre d'étude et de conservation des oeufs et du sperme humains*) and thus tried to help another couple. This recruitment method is called the relational method because infertile couples sensitize friends or family in this way. This kind of donor recruitment enables faster treatment of couples who are before them on the waiting list in France [1].

One of the methods of recruiting donors is the so-called altruistic recruitment method. In Europe, the practice of donating body material is mainly oriented towards the altruistic model of donation. The condition of the altruistic model is that the donation is based on charitable motives, i.e., the desire to help others. However, this model fails to recruit a sufficient number of donors, which is why financial incentives (payments) have been proposed as a means of increasing the number of donors [9].

In some countries, there is a method of recruitment where basic expense costs are paid. Lack of consensus on whether the donor should receive money at all and, if so, what it should be for (for instance, payment for the service, compensation for lost earnings, or simply the minimum reimbursement of expenses incurred by the donor through the act of donation, e.g., travel expenses to the place of donation, etc.). The practice can be seen in the variety of laws and guidelines [10]. In Belgium, the costs ranged from 500 EUR to 2,000 EUR. Some centers offered nothing in exchange for egg donation, while others provided a complete free *in vitro* fertilization (IVF) cycle. In the Czech Republic, this amount is 560 EUR, in Finland 250 EUR, Greece from 900 EUR to 1,000 EUR, Poland from 935 EUR to 1,400 EUR, Portugal 650 EUR, Spain from 700 EUR to 1,300 EUR, Ukraine from 400 EUR to 640 EUR, and Great Britain fixed 870 EUR [11].

IVF programs are one type of donor recruitment practice. Women undergoing IVF may agree to donate excess eggs to infertile patients. This donor source is limited because this type of donation can be considered forced, especially if donors are offered a financial discount on their own IVF cycle [12]. In exchange for egg donation, some centers provide a completely free IVF cycle, which is the case in Belgium, while Poland funds the cycle partially, Ukraine also offers a partially funded IVF cycle, and, in the United Kingdom (UK), some offer a free full cycle, and some fund a part of the cycle [11].

Different motivations (incentives) of donors can lead to the decision of whether donors want to donate their reproductive material. One incentive could be to allow them to save their own reproductive cells (social freezing) specifically for egg donors; perhaps this could become a higher threshold of motivation to donate. Research shows that different donor motivations need to be evaluated because when it comes to egg donors, there is a risk, procedure, inconvenience, and time they spend for donation [13].

The first law on biomedically assisted fertilization (BMAF) in the RS is the Law on Treatment of Infertility and Procedures of Fertilization with Biomedical Assistance, first adopted in 2009 ("Official Gazette", No. 72/09). The law states that donations are allowed. However, the import and export of reproductive cells and surrogacy are prohibited. Pursuant to Article 42 of this Law, the Minister shall issue a license to one of the authorized health institutions referred to in paragraph 1 of this Article that will perform the activities of a bank of donated reproductive cells for the territory of the RS, by the law governing cell and tissue transplantation [14].

The second law, the Law on Biomedical Assisted Fertilization ("Official Gazette", No. 40/2017 and 113/2017-state law), was passed in 2017. The new law enables the import or export of reproductive cells if there is none in the "Bank"; it has also been extended to cases of preservation of fertility and social freezing, but surrogacy is prohibited. Although the first law on permitted donation was passed in 2009, there is still no documented data on the first gamete donation in the RS. Pursuant to Article 33 of the Law on BMAF, the prohibition of advertising referred to in paragraph 1 of this Article does not apply to the promotion of voluntary donation of reproductive cells and tissues, i.e., BMAF, which is organized and implemented by law [15].

The goal of the paper is to present a theoretical overview and perform a practical analysis of the use of social marketing strategies using the first technologies of analyzing the attitudes of potential donors of reproductive cells in the RS, which would go in the direction of more specific adaptation to the target group.

Methods

In this paper, a survey was conducted on a specific group of users who met one of the conditions (age) for a donation of reproductive cells and did a segmentation in order to assess the main desire of donors to get involved in the donation program and thus realize the offers and opportunities that are available today. Here, we analyze the supply through a communication strategy in the form of a questionnaire. Therefore, a Google questionnaire was designed with the main socio-demographic characteristics (age, marital status, education, reproductive history), reasons for donating (altruism, treatment, financial gain), information on donations, counseling, and choice of health institutions. The electronic survey was sent to 201 women and men aged between 20 and 34 years, including all social classes and geographical locations in the RS. We compared three groups of respondents using statistical analysis (those who would donate, those who would not, and those who might donate if they had more information about the donation). Nominal data were presented as frequencies with percentages and the corresponding 95% confidence intervals. Demographic characteristics and attitudes and opinions toward reproductive material donation are analyzed using a Chi-squared test and Fisher's exact test as appropriate. SPSS 21.0 (SPSS Inc., Chicago, Illinois) was used to perform statistical analyses. The level of statistical significance was set at $p < 0.05$. The questions from the first part of the questionnaires were tested for internal consistency, which was tested by Cronbach's alpha coefficient calculation (α). Values of α lower than 0.5 indicate that the questionnaire possesses unacceptable consistency.

Results

This study included 201 participants; 14 participants were excluded from the statistical analysis because they did not complete the questionnaire. The demographic characteristics of 187 participants are presented in Table 1. Most study participants were women; more than half were aged 30–34 years; two-thirds were highly educated, and almost 75% were employed. More than half of the participants were married or lived in extramarital unions. Forty percent of participants had children. The Cronbach's α value was 0.5, meaning the questionnaire is reliable. As the study did not have the aim to develop a questionnaire and, therefore, did not possess specific domains (constructs), this value confirms that the questionnaire may include these questions.

Attitudes and opinions toward reproductive material donation are presented in Tables 2 and 3. Forty-eight percent of participants met couples who needed help conceiving through *in vitro* fertilization, and 23% had personal experience with this issue. Less than half of the participants were fully informed, 38% partially, and 19% were not informed about the donation of reproductive material (eggs, sperm). Most (57%) of the participants were informed about reproductive cell donation through the Internet, 29% by friends and family, and 11% were informed by doctors. Only 32% of participants are fully informed, and 25.1% are partially informed about the donation of reproductive material in the RS. Forty-three percent of participants were not informed about the donation of reproductive material. Most (54%) of the participants said they would maybe donate their reproductive material if they had more information, 20% would donate in any case, and 26% would refuse reproductive material donation. Half (50.3%) of participants said that they would donate their material voluntarily, 22.5% would donate to a friend or relative, 16% to their partner, and 5.3% would donate with financial support. Only 21% of participants knew whom to contact in case of reproductive material donation. Sixty-nine percent of participants would choose a private clinic to perform the necessary analyses of their health condition, and 31% would choose a state clinic; 73.8% of participants said they would be more comfortable donating material in a private clinic; 70.6% would be motivated to donate reproductive material with compensation for free storage of their material for the future; 60.4% of participants knew that donations are anonymous. Almost all participants (93.6%) thought that the awareness of the people about donations of reproductive material should be raised through promotions – by conducting campaigns. In addition, 94.7% of participants thought that doctors could have an influence on raising people's awareness by encouraging patients and informing them about reproductive cell donations.

The questions from the first part of the questionnaire in Table 2 were tested for internal consistency. The Cronbach's α value was 0.5, which means that the questionnaire is reliable.

When attitudes and opinions toward the donation of reproductive material were compared between men and women, women more often reported they would choose a private clinic for necessary analyses of health conditions ($p = 0.019$) (Figure 1). Furthermore, women more often reported they would be more comfortable donating their reproductive material to a private institution ($p = 0.029$) (Figure 2).

Table 1

Demographic characteristics of participants

Parameter	Values	Bounds of 95% CI	
		lower	upper
Gender			
male	47 (25.1)	19.3	31.7
female	140 (74.9)	68.3	80.7
Age, years			
21–25	39 (20.9)	15.5	27.1
25–29	50 (26.7)	20.8	33.4
30–34	98 (52.4)	45.3	59.5
Education			
elementary	3 (1.6)	0.5	4.2
high school	59 (31.6)	25.2	38.5
college	125 (66.8)	59.9	73.3
Employment			
unemployed	27 (14.4)	10.0	20.0
student	21 (11.2)	7.3	16.3
employed	139 (74.3)	67.7	80.2
Marriage status			
married	70 (37.4)	30.7	44.5
single	72 (38.5)	31.7	45.6
extramarital union	45 (24.1)	18.4	30.6
Children			
yes	75 (40.1)	33.3	47.2
no	112 (59.9)	52.8	66.7

CI – confidence interval.
All values are expressed as numbers (percentages) or only percentages (for bounds of 95% CI).

Table 2

Attitudes and opinions toward reproductive material donation (the first part of the questionnaire)

Questions	Values	Bounds of 95% CI	
		lower	upper
Have you met couples who needed help conceiving through *in vitro* fertilization?			
yes, personal	43 (23)	17.4	29.4
no	54 (28.9)	22.7	35.7
friends/family	90 (48.1)	41.0	55.3
Are you informed about what it means to donate your reproductive material (eggs, sperm)?			
yes	79 (42.2)	35.3	49.4
partially	72 (38.5)	31.7	45.6
no	36 (19.3)	14.1	25.3
Do you know that you can donate your reproductive material (eggs and sperm) in the Republic of Serbia?			
yes	60 (32.1)	25.7	39.0
partially	47 (25.1)	19.3	31.7
no	80 (42.8)	35.8	49.9
Would you donate your reproductive material – eggs, sperm?			
yes	38 (20.3)	15.0	26.5
maybe, if I had more information	100 (53.5)	46.3	60.5
no	49 (26.2)	20.3	32.8
If you want to donate your reproductive material, do you know who to contact?			
yes	41 (21.9)	16.5	28.3
no	146 (78.1)	71.7	83.5
Would it motivate you to donate reproductive material with compensation for free storage of your material for the future – by freezing?			
yes	132 (70.6)	63.8	76.8
no	55 (29.4)	23.2	36.2
Do you know that donations are anonymous (without the possibility of knowing who the donors are and who received the reproductive material)?			
yes	113 (60.4)	53.3	67.2
no	74 (39.6)	32.8	46.7
Do you think that the awareness of the people about donations of reproductive material should be raised through promotions – by conducting campaigns?			
yes	175 (93.6)	89.4	96.4
no	12 (6.4)	3.6	10.6
Do you think that doctors can influence to raise people's awareness by encouraging patients by informing them about reproductive cell donations?			
yes	177 (94.7)	90.7	97.2
no	10 (5.3)	2.8	9.3

CI – confidence interval.
All values are expressed as numbers (percentages) or only percentages (for bounds of 95% CI).

Next, the demographic characteristics of participants were compared by donation decision in Table 4. There were no significant differences between donation status and gender and age. Education was significantly different between groups. In a group of participants who decided not to donate, most of them were highly educated people. In a group of participants who would donate reproductive material, half of them were married; the difference was significant according to donation status. There were no differences between donation opinion and children status.

Attitudes toward reproductive material donation according to donation opinion are shown in Table 5. According to the participant's donation opinions, knowing people who needed reproductive cell donation made no difference. Most of the participants who would donate their reproductive material were more informed about what it means; the difference was significant. Most of the participants who would refuse to donate reproductive material were informed through the Internet; the difference was close to the conventional level of significance ($p = 0.084$). Most of the participants who would donate reproductive material were informed through friends and family; the difference was close to the conventional level of significance ($p = 0.096$). Participants who would donate their reproductive material were more often informed about the donations in the RS; the difference was close to the conventional level of significance ($p = 0.092$).

Table 3

Attitudes and opinions toward reproductive material donation (the second part of the questionnaire)

Questions	Values	Bounds of 95% CI	
		lower	upper
Where did you hear the information about reproductive cell donations?			
not responded	6 (3.2)	1.4	6.5
internet	106 (56.7)	49.5	63.6
doctors	21 (11.2)	7.3	16.3
friends/family who needed help	54 (28.9)	22.7	35.7
What would be your motive if you wanted to donate reproductive material?			
not reported	11 (5.9)	3.2	9.9
altruism	94 (50.3)	43.1	57.4
financial	10 (5.3)	2.8	9.3
if my partner would need a donation	30 (16)	11.3	21.8
for a friend/relative	42 (22.5)	16.9	28.8
If you wanted to donate your reproductive material at some point, which institution would you choose to perform the necessary analyses of your health condition?			
state fertility clinic	58 (31)	24.7	37.9
private fertility clinic	129 (69)	62.1	75.3
Where would you be more comfortable donating your reproductive material, if you wish?			
state fertility clinic	49 (26.2)	20.3	32.8
private fertility clinic	138 (73.8)	67.2	79.7

CI – confidence interval.

All values are expressed as numbers (percentages) or only percentages (for bounds of 95% CI).

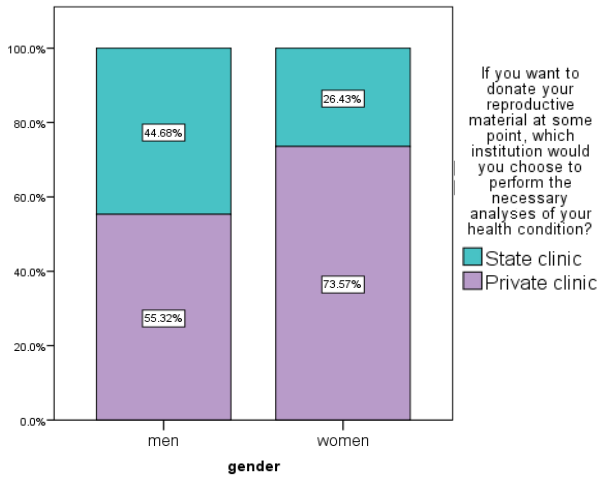

Fig. 1 – Institution selection between men and women for necessary analyses of health conditions.

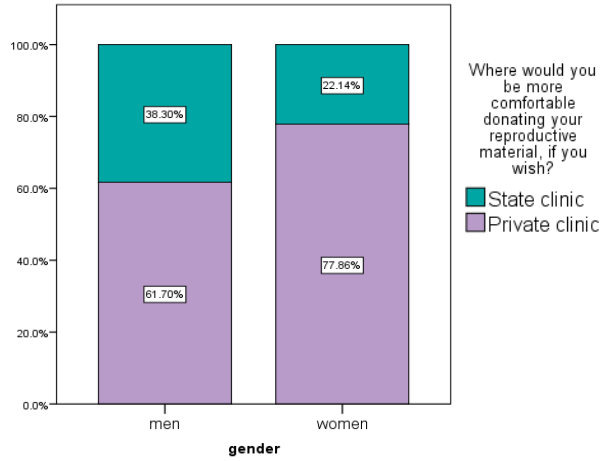

Fig. 2 – Institution selection between men and women for donation of reproductive material.

Table 4

Demographic characteristics of participants according to the decision about reproductive material donation

Parameter	Donation decision			
	yes	maybe	no	*p*
Gender				
male	13 (34.2)	24 (24)	10 (20.4)	0.314
female	25 (65.8)	76 (76)	39 (79.6)	
Age, years				
21–25	7 (18.4)	25 (25)	7 (14.3)	
25–29	7 (18.4)	24 (24)	19 (38.8)	0.135
30–34	24 (63.2)	51 (51)	23 (46.9)	
Education				
elementary	2 (5.3)	1 (1)	0 (0)	
high school	15 (39.5)	39 (39)	5 (10.2)	< 0.001
college	21 (55.3)	60 (60)	44 (89.8)	
Employment				
unemployed	7 (18.4)	11 (11)	9 (18.4)	
student	5 (13.2)	12 (12)	4 (8.2)	0.622
employed	26 (68.4)	77 (77)	36 (73.5)	
Marriage status				
married	19 (50)	36 (36)	15 (30.6)	
single	16 (42.1)	33 (33)	23 (46.9)	0.36
extramarital union	3 (7.9)	31 (31)	11 (22.4)	
Children				
yes	16 (42.1)	43 (43)	16 (32.7)	0.462
no	22 (57.9)	57 (57)	33 (67.3)	

All values are expressed as numbers (percentages).

Table 5

Attitudes and opinions toward reproductive material donation according to donation opinion

Parameter	Donation opinion			
	yes	maybe	no	*p*
Have you met couples who needed help conceiving through *in vitro* fertilization?				
yes, personal	11 (28.9)	21 (21)	11 (22.4)	
no	12 (31.6)	24 (24)	18 (36.7)	0.303
friends/family	15 (39.5)	55 (55)	20 (40.8)	
Are you informed about what it means to donate your reproductive material (eggs, sperm)?				
yes	25 (65.8)	35 (35)	19 (38.8)	
partially	6 (15.8)	49 (49)	17 (34.7)	0.002
no	7 (18.4)	16 (16)	13 (26.5)	
Where did you hear the information about reproductive cell donations?				
not responded	3 (7.9)	2 (2)	1 (2)	1.000
internet	15 (39.5)	59 (59)	32 (65.3)	0.084
doctors	6 (15.8)	8 (8)	7 (14.3)	0.273
friends/family who needed help	14 (36.8)	31 (31)	9 (18.4)	0.096
Do you know that you can donate your reproductive material (eggs and sperm) in the Republic of Serbia?				
yes	18 (47.4)	27 (27)	15 (30.6)	
partially	7 (18.4)	31 (31)	9 (18.4)	
no	13 (34.2)	42 (42)	25 (51)	0.092
What would be your motive if you wanted to donate reproductive material?				
not responded	0 (0)	1 (1)	10 (20.4)	< 0.001
altruism	26 (68.4)	56 (56)	12 (24.5)	0.003
financial	3 (7.9)	6 (6)	1 (2)	0.582
if my partner would need a donation	6 (15.8)	12 (12)	12 (24.5)	0.031
for a friend/relative	3 (7.9)	25 (25)	14 (28.6)	0.014
If you want to donate your reproductive material, do you know who to contact?				
yes	12 (31.6)	17 (17)	12 (24.5)	
no	26 (68.4)	83 (83)	37 (75.5)	0.159

Table 5 (continued)

Parameter	Donation opinion			
	yes	maybe	no	*p*
If you wanted to donate your reproductive material at some point, which institution would you choose to perform the necessary analyses of your health condition?				
state fertility clinic	15 (39.5)	31 (31)	12 (24.5)	
private fertility clinic	23 (60.5)	69 (69)	37 (75.5)	0.325
Where would you be more comfortable donating your reproductive material, if you wish?				
state fertility clinic	12 (31.6)	24 (24)	13 (26.5)	
private fertility clinic	26 (68.4)	76 (76)	36 (73.5)	0.663
Would it motivate you to donate reproductive material with compensation for free storage of your material for the future – by freezing?				
yes	32 (84.2)	79 (79)	21 (42.9)	
no	6 (15.8)	21 (21)	28 (57.1)	< 0.001
Do you know that donations are anonymous (without the possibility of knowing who the donors are and who received the reproductive material)?				
yes	27 (71.1)	56 (56)	30 (61.2)	
no	11 (28.9)	44 (44)	19 (38.8)	0.269
Do you think that the awareness of the people about donations of reproductive material should be raised through promotions – by conducting campaigns?				
yes	36 (94.7)	98 (98)	41 (83.7)	
no	2 (5.3)	2 (2)	8 (16.3)	0.003
Do you think that doctors can influence to raise people's awareness by encouraging patients by informing them about reproductive cell donations?				
yes	36 (94.7)	98 (98)	43 (87.8)	
no	2 (5.3)	2 (2)	6 (12.2)	0.033

Participants who would donate would more frequently voluntarily make a donation; the difference was significant compared to participants who would refuse to donate or those who would maybe donate reproductive material. Less than 10% of participants in all groups, according to donation status, would donate for financial compensation. There was no significant difference. Most of the participants who refuse to donate would change their opinion if their partner needed a donation; the difference was significant compared to participants who would donate or those who might donate reproductive material. Likewise, participants who would refuse to donate or who might donate would change their minds if a friend needed a donation. There was no significant difference between participants knowing whom to contact in case of reproductive material donation. Most participants in all three groups would choose private clinics to perform the necessary analyses; the difference was not significant according to donation opinion. Again, most participants reported that they would be more comfortable donating their materials in a private clinic; the difference was not significant according to donation opinion. Participants who would refuse to donate material would be significantly less motivated with compensation for free storage of their material for the future. Although most participants think that the awareness of the people about donations of reproductive material should be raised by promotions, those who would refuse to donate think this significantly less often. Likewise, those who would refuse to donate think significantly less often that doctors can have an influence in raising people's awareness by encouraging patients and informing them about reproductive cell donations.

Discussion

In order to meet the demand for reproductive material and the requirements of healthcare users whose medical indications require treatment of infertility with third-party assisted reproduction, the research tried to examine the possibility of potential supply and the opinion of the population of the RS on how to raise awareness of potential future reproductive cell donors and how to recruit donors to meet the patient's needs for donation services. Furthermore, the research tried to investigate the needs of donors as a target audience in order to perform a way of donating with as little stress as possible, the way they would like to be informed, the institutions they would prefer for their examination, and the reasons that would make them agree to donate their reproductive material, since a certain number of donors may be lost due to inadequate services. The application of marketing in healthcare has been criticized [16, 17] and made impossible for ethical reasons, and the question arises for further research as to which of the communication and promotional channels would be appropriate in order to provide the necessary information to reproductive material donors. Since the interpretation of ethics depends on the health policy and the quality of the legislative framework of the RS, this paper, by having an insight into public opinion, would present the necessary conditions that would satisfy potential donors and thus provide an understanding of the potential meeting of the supply.

Governments and clinics do not invest in public awareness campaigns or promote reproductive cell donations, so

donor recruitment is hampered by a lack of information, organization, and conditions. The United Kingdom has a National Gamete Donation Trust (NGDT), a body that raises awareness of the national shortage of sperm, egg, and embryo donors in the UK. This organization aims to recruit donors to reduce shortages and provides information on egg, sperm, and embryo donation and donor recruitment in the UK [9, 18]. In France, *Agence de la Biomedicine* has a similar role as the British NGDT [9].

In order to value the good that we get from donations, we should accept donors with mixed motives, as long as helping others is an important motive, as well as the characteristics of their motivation [9]. When it comes to egg donors, it can be argued that non-payment of donors is disrespectful and devalues the importance of their physical contribution and potential impact on their health [19].

Conclusion

Recruiting gamete donors is a complex issue. The target group of potential donors of reproductive cells exists in the RS. In addition to analyzing attitudes, further planning and implementation of certain attitudes could raise awareness about the lack of reproductive material and increase the recruitment of gamete donors. Experts and the government play a key role and need to address this issue. Reproductive cell donations, organization (procedure control), regulations, promotion, and population education should all be better regulated to raise public awareness of this problem. Currently, there is a shortage, little money is spent, and little effort is taken when it comes to awareness campaigns about germ cell donation. Constant effort in practical aspects would affect the recruitment of donors, and altruism and volunteering should not be absolute criteria as they currently are in the RS. An analysis of different conditions and rules of different systems of other countries can reveal a range of morally acceptable variants. We need creativity in designing a better system and flexibility in the application of existing systems of other countries if we want to cover the needs of donor gametes of patients of the RS so that they do not have to seek medical help outside their country if there is already a law whose small amendment could make great progress.

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