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Risk Behavior and Reciprocity of Organ Donation Attitudes in Young Men

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Abstract

Background—Lack of donor organs remains a major obstacle in organ transplantation. Our aim was to evaluate (1) the association between engaging in high-risk recreational activities and attitudes toward organ donation and (2) the degree of reciprocity between organ acceptance and donation willingness in young men.

Methods—A 17-item, close-ended survey was offered to male conscripts ages 18 to 26 years in all Swiss military conscription centers. Predictors of organ donation attitudes were assessed in bivariate analyses and multiple logistic regression. Reciprocity of the intentions to accept and to donate organs was assessed by means of donor card status.

Results—In 1559 responses analyzed, neither motorcycling nor practicing extreme sports reached significant association with donor card holder status. Family communication about organ donation, student, or academic profession and living in a Latin linguistic region were predictors of positive organ donation attitudes, whereas residence in a German-speaking region and practicing any religion predicted reluctance. Significantly more respondents were willing to accept than to donate organs, especially among those without family communication concerning organ donation.

Conclusions—For the first time, it was shown that high-risk recreational activities do not influence organ donation attitudes. Second, a considerable discrepancy in organ donation reciprocity was identified. We propose that increasing this reciprocity could eventually increase organ donation rates.

Despite the success story of solid-organ transplantation regarding survival, quality of life, cost-effectiveness [1,2], and a wide public acceptance [3–6], the number of available donor

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organs meets less than 10% of global needs [7]. Annual organ donation rates diverge widely from Spain (35.3 donations per million people, pmp), Belgium (29.2 pmp), France (26.0 pmp), the United States (25.8 pmp) to considerably lower rates for the United Kingdom (21.0 pmp), the Netherlands (15.9 pmp), and Germany (10.7 pmp). Switzerland (13.6 pmp) has one of the lowest organ donation rates in Europe, with 3% to 4% of patients on the waiting list dying each year [8,9]. Refusal by the next-of-kin is a main reason that organs are not donated under both presumed and explicit consent systems [10–13]. However, the Israeli parliament passed a law that prioritizes transplantation candidates who had already been registered as organ donors themselves or had previously given their consent for organ retrieval in a deceased family member [14]. Preliminary results showed an increase in national organ donation rates [15].

Although most people approve organ donation on theoretical discussion, donor card holder rates remain low throughout all age groups [5,16–18], including young people [19–21]. This is to some extent surprising, because younger age has been identified as a predictor of positive attitudes toward organ donation [22].

Unintentional injury is the leading cause of death among young adults (ages 18–24 years) in the United States. Young American men are 3 times more likely to die of an injury than are women, whereas motor vehicle accidents cause roughly 70% of young adults' unintentional fatal injury [23]. Likewise, Swiss men “of age” 18 to 24 years are at highest risk for fatal motor vehicle accidents [24].

In general, (young) men are more likely to engage in risky behavior than are women [23,25]. Although regular engagement in physical activity shows a trend toward higher donor card holder rates [17], it is unknown whether pursuing high-risk recreational activities such as motorcycling and extreme sports is associated with specific organ donation attitudes. People engaging in risky behaviors tend to have a realistic perception of the risks they are taking [26]. We therefore aimed to investigate whether motorcycling and practicing extreme sports are associated with positive organ donation attitudes as the result of the possibility of raised awareness for potentially fatal accidents. Furthermore, we aimed to evaluate the degree of reciprocity between organ acceptance and donation among a relevant sample of young Swiss men.

Methods

Study Design

A written cross-sectional questionnaire and a corresponding information sheet were offered to all conscripts being evaluated at the 6 conscription centers of Switzerland. The study was approved by the Swiss Armed Forces and was exempt from full ethics committee review by the head of the local ethics committee. All responses remained anonymous and were untraceable by any identifiers.

Questionnaire Development

A specific questionnaire was developed, pilot-tested among 20 subjects, and checked for internal reliability by means of Cronbach's α , according to guidelines [27,28]. The survey

and the information sheet were translated from German to French and Italian by native-speaker medical professionals and back to German by professional translators (forward-and-back method [29]). A power analysis that used available effect sizes [30] estimated a sample size of 70 participants for reciprocity testing.

Questionnaire

The questionnaire contained 17 close-ended items: (Q1) age, (Q2) sex, (Q3) ZIP-Code of hometown, (Q4) highest completed level of education (secondary school, vocational baccalaureate, academic baccalaureate, college of higher education, university), (Q5) profession/occupational area (academic, student/apprentice, craftsman/agriculturalist, service occupation, office worker, unemployed, other), and (Q6) religion (Christianity, Islam, Judaism, Buddhism, Hinduism, other). We asked for personal opinion toward organ donation: (Q7) “In order to help others, I find postmortem organ donation to be legitimate” (yes, no), (Q8) “I own an organ donor card” (yes, no, no—but I would like to have one), (Q9) “My religion has an influence on my willingness to donate organs” (yes, no), (Q10) “I know of at least one of my parents whether they wish to donate organs after they die” (yes, no), (Q11) “My parents know whether I wish to donate organs after I die” (yes, no), (Q12) “I would donate the organs of a next-of-kin or spouse who died, if he or she had not explicitly objected doing so” (yes, no), (Q13) “I pursue one or more of these recreational activities at least 5 times per year: outdoor climbing, glacier hiking, skydiving, canyoning, free-ride skiing/snowboarding” (yes, no), (Q14) “I am a motorcyclist” (yes, no), (Q15) “I would generally approve a next-of-kin’s or my spouse’s organ acceptance from a recently deceased person, if needed” (yes, no), (Q16) “I would generally accept an organ from a recently deceased person for myself, if needed” (yes, no), and (Q17) “I would generally accept an organ from a recently deceased person for my own child, if needed” (yes, no).

Data Analysis

Demographic data of conscription records of 2013 were obtained from the Swiss federal government. ZIP codes were recoded to language region and residency through the use of the MAT[CH]zip service available online at <http://www.post.ch> (accessed February 10, 2014). Full details of variable coding are shown in Table 1. Continuous variables were analyzed by means of *t*-test or Wilcoxon rank-sum test and categorical data by means of χ^2 or Fisher’s exact test, as appropriate. Significance was assumed at $P < .05$ (2-tailed).

Prediction of having or wanting an organ donor card was tested in 16 univariate models for age and dichotomous coded variables (Table 1). All variables predicting “having or wanting an organ donor card” with $P < .1$ were retained for multivariate analysis. Variables without significance in an automated backward selected model were manually dropped. Odds ratios (OR) and 95% confidence intervals (CI) were calculated by likelihood-ratio test, and variables were tested for multicollinearity. To assess reciprocity of organ acceptance and donation, donor card status was assessed for participants who would accept organs for any of themselves, next-of-kin, or their child. All statistical calculations were performed with the use of R 3.0.2 software.

Results

Data of 1576 participants were collected during 2013 over 1.9 ± 0.6 months (mean \pm SD per conscription center). A total of 17 responses were excluded because of age exceeding 25 years ($n = 5$), female sex ($n = 2$), and study site with very low participant number ($n = 10$). Participation at this site was considered too low to yield a representative sample. The response rate for the 6 sites was 24.9%.

Participants were compared with the national conscription records of 2013 (Table 2). The respondents were slightly younger, indicated student or academic as their occupation more frequently, and rather lived in the German-speaking region of Switzerland; 88.1% considered organ donation to be legitimate in order to help others, but only 6.3% had and 19.4% wanted to obtain an organ donor card; 53.6% would approve to donate their next-of-kin's organs; 19.8% knew their parents' wishes regarding post mortem organ donation, and 19.1% had communicated their own wishes to their parents; 84.8% would generally approve of their spouse or next-of-kin to accept a donor organ, whereas 84.3% would accept one for themselves. To save their own child, 91.8% would accept a donor organ.

Bivariate analyses with respect to presence of an organ donor card are shown in Table 3. Subjects having or wanting a donor card differed from those refusing a donor card in language region, education, religion, communication within the family, and organ acceptance. Notably, motorcycling and engaging in extreme sports did not reach statistical significance to be associated with donor card holder status.

Multiple logistic regression analysis (Table 4) showed that respondents were more likely to have or want an organ donor card if they were scholars, if they had communicated their wishes regarding organ donation, if they thought that organ donation is legitimate, or if they were willing to approve organ donation of a deceased next-of-kin. Further predictors of having or wanting a donor card were living in a Swiss Latin language (French or Italian) region, having no religion, knowing one's parents' organ donation wishes, and willingness to accept an organ for oneself. These four variables influenced the model significantly only if analyzed in combination. However, dropping them increased the Akaike Information Criterion only marginally. Events per variable for the less common observations were sufficient (defined as above 10) [31] for 14 of 16 variables but not for the questions on influence of religion (Q9) and on accepting organs for one's child (Q17).

A higher proportion of respondents were willing to accept organs for themselves or their beloved ones than those who intended to return the service by having or wanting a donor card (Fig 1). Of those willing to accept organs for either themselves or their family, 6.6% already possessed and 20.4% wanted an organ donor card. Strikingly, 73% would accept organs but neither had nor wanted a donor card. In the group not willing to accept organs, only 2.4% held a donor card and 8.4% wanted one.

In a subgroup analysis of the participants who would accept organs, absence of family communication about organ donation wishes was associated with an even smaller probability to have or want a donor card ($P < .001$).

Discussion

In the present study, no significant relationship could be detected between accident-prone activities and organ donation attitudes among young Swiss men. Second, this study revealed a low degree of reciprocity between accepting and donating organs.

The present survey is the first nationwide study inquiring organ donation attitudes among young men from all linguistic regions of Switzerland. This country offers the unique opportunity to compare socio-cultural aspects in 3 linguistic and cultural regions without any differences in legislation. Because conscription is mandatory for all Swiss men, a representative population was given the possibility to participate in the survey. Furthermore, to the best of our knowledge, this is the first study evaluating whether participation in accident-prone activities is associated with altered attitudes toward organ donation. The fact that several already-established predictors of organ donation were confirmed in the present survey might serve as a sign of adequacy of the instrument used.

The study is relevant because, despite generally positive attitudes toward organ donation [3–6], high refusal rates still severely limit organs available for transplantation [10–12]. This is particularly important for Switzerland, where the decline rate of 54.4% by the deceased's relatives is substantially higher than average (Belgium: 11.9%, Spain: 15.9%, United States 22.5%, Italy 29.4%) [8]. Identifying differences in donation attitudes among different demographic groups might guide interventions to increase donation consent rates.

Heterogeneities in adults' willingness to donate organs across Switzerland's different linguistic regions have already been reported [18,32,33]. The present study confirms them also in the young, because French- and Italian-speaking respondents were twice as likely to have a donor card than the German-speaking participants. In contrast, analyses of living in rural or in urban areas did not disclose significant differences in donation attitudes. Holding fewer religious beliefs, having completed a higher level of education, and family communication with respect to organ donation were associated with positive attitudes toward organ donation, in accord with previous findings [19,22].

Surprisingly, in the analyzed sample, pursuing high-risk sports or being a motorcyclist was not associated with altered organ donation willingness, revoking the hypothesis that engaging in risky behaviors would raise awareness for the possibility of fatal accidents and subsequently lead to an increased likelihood of holding an organ donor card.

The percentage of respondents who stated that they would accept organs for themselves or their loved ones was higher than the rate of those having or wanting a donor card and those who would approve donation of their next-of-kin's organs. For the first time, the obtained data confirmed this discrepancy in a large sample of young males, a finding previously reported only in smaller studies among well-defined religio-cultural populations [30,34]. A systematic analysis of this phenomenon in other demographic and ethnic groups is warranted because the low degree of reciprocity has been proposed as a contributor to low organ donation rates among certain social minorities, which could be addressed by prioritization laws [35]. In fact, prioritization laws might be able to exploit the donor potential of a population that in general highly approves organ donation by cleverly dodging

its current passiveness in signing donor cards and joining donor registries. “Reciprocal altruism” [36], in which those in society who are willing to help others will be helped in return as well, could represent for many people a solid incentive to sign donor cards or become registered donors [37].

This study has some limitations. First, the overall response rate of approximately 25% is relatively low. Second, some demographical differences were found between respondents and the complete national conscription records of 2013. Despite reaching statistical significance, however, the differences in age, linguistic distribution, and student percentage are numerically very small and therefore unlikely to have introduced a major bias. Third, because we analyzed only young men, these data might not be generalized to the whole Swiss young population (that is, including women).

Conclusions

The present data show for the first time that, although roughly 40% of young men engage in extreme sports and 20% in motorcycling, none of these behaviors are associated with altered attitudes toward organ donation. Additionally, this study demonstrates a low degree of reciprocity between accepting and donating organs in a large sample of young men. Finally, the present data confirm previously established predictors of attitudes toward organ donation, such as education, family communication, religiosity, and linguistic background. The implementation of prioritization laws might address the discrepancy in organ donation reciprocity by increasing organ donation rates. Further studies are warranted to assess the long-term potential of such interventions.

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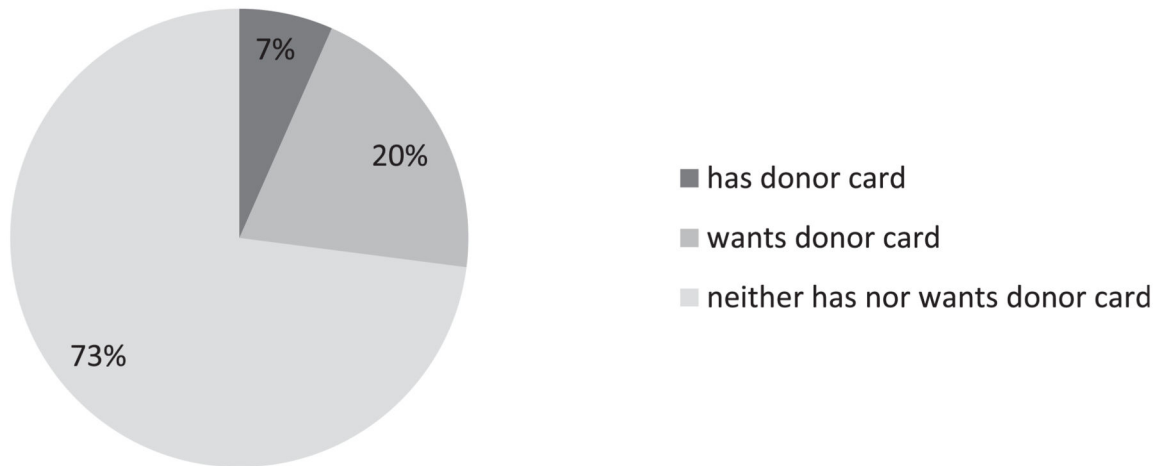
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Donor card status of those that accept organs



Donor card status of those that refuse organs

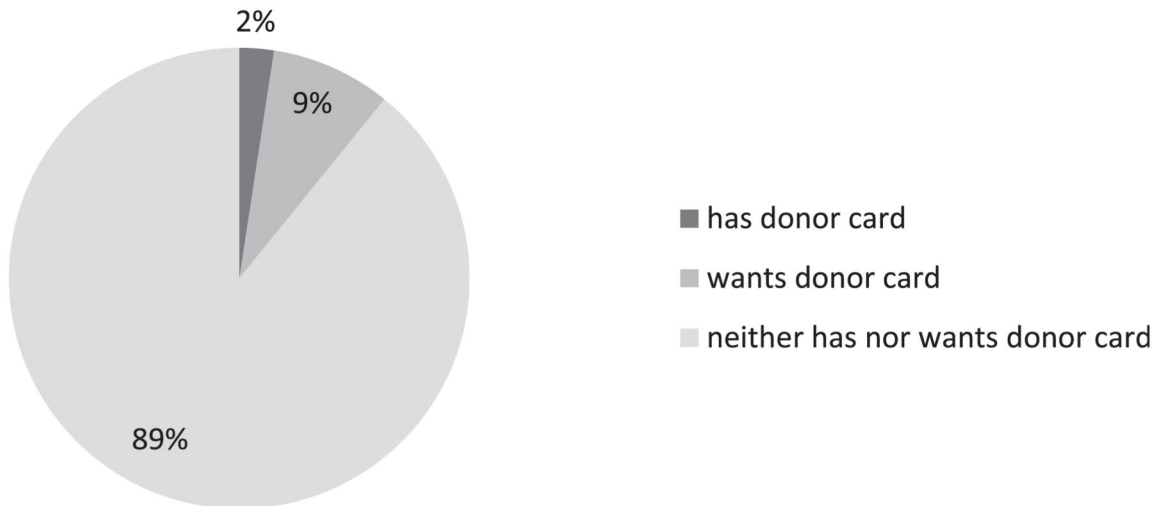


Fig 1.

Organ donor card status in those who would or would not accept donor organs for themselves, their next of kin, or their child; 100% of the responses in the upper panel represent the 1420 participants who would accept a donor organ and 100% of the lower panel represent the 83 participants who would refuse a donor organ under all circumstances.

Table 1
Variable Coding

Source	Observation to Be Recoded	Newly Defined Groups
Coding for bivariate analyses		
Q3	(ZIP code algorithm)	German, French, Italian language region
Q3	(ZIP code algorithm)	Urban/agglomeration, rural residency
Q4	academic baccalaureate, college of higher education, university	Higher education
Q5	academic, student	School/university
Q5	craftsman/agriculturalist, service occupation, office worker	Work
Q6	Buddhism, Hinduism, other	Other
Q10/11	Any "yes" in Q10/11	Dichotomous "yes" or "no"
Coding for univariate and multivariate modeling		
Q8	Having or wanting a donor card	Dichotomous "yes" or "no"
Q3	German language region	Dichotomous "yes" or "no"
Q3	Urban/suburban residency	Dichotomous "yes" or "no"
Q4	Higher education	Dichotomous "yes" or "no"
Q6	Religion	Dichotomous "yes" or "no"

Q3 to Q11, survey questions 3 to 11.

Table 2
Comparison of Participants With the Overall National Conscription Records

	Participants	Reference Population	<i>P</i> Value
Overall	1559	40,367	<.001 [*]
Age median	19	20	
Age, IQR	1	1	
Language			
German	1173 (75.2%)	28,956 (71.7%)	<.001 [†]
French	302 (19.4%)	9846 (24.4%)	
Italian	46 (3.0%)	1507 (3.7%)	
Unknown	38 (2.4%)	58 (0.1%)	
Occupation			
Student	519 (33.3%)	10,623 (26.3%)	<.001 [†]
Other	1008 (64.7%)	27,598 (68.4%)	
Unknown	32 (2.1%)	2146 (5.3%)	

Abbreviation: IQR, interquartile range.

^{*} Wilcoxon rank-sum test.

[†] χ^2 test.

Table 3
Factors Influencing Donor Card Status in Bivariate Analysis

	Overall	Owns Donor Card			P Value
		Yes	Wants One	No	
Overall					
Mean	1559	97	301	1155	
Percentage		6.30%	19.20%	74.40%	
Age					
Mean (SD)	19.30 (1.08)	19.47 (1.16)	19.28 (1.01)	19.29 (1.10)	NS
Language region					
German	1173	5.10%	17.90%	77.00%	.0003
French	302	10.10%	24.50%	65.60%	
Italian	46	9.90%	23.90%	65.20%	
Residence					
(Sub)urban	1027	6.30%	19.50%	74.10%	NS
Rural	494	6.10%	19.10%	74.70%	
Highest education					
Compulsory	1079	5.20%	18.50%	76.30%	.0002
Vocational	154	6.50%	20.10%	73.40%	
Higher	195	8.70%	27.70%	63.60%	
Other	35	20.00%	22.90%	57.10%	
Religion					
None	367	8.10%	26.30%	65.60%	.0002
Christian	1044	5.40%	15.90%	78.60%	
Islam	89	0.00%	22.20%	77.80%	
Other	28	0.00%	25.00%	75.00%	
Influence of religion					
Yes	72	8.30%	16.70%	75.00%	NS
No	1460	6.20%	19.80%	74.00%	
Donation is legitimate					
Yes	1352	6.90%	21.60%	71.50%	<.0001
No	183	2.20%	4.40%	93.40%	
Knowledge of your parents' donation attitude					
Yes	306	16.40%	33.40%	50.20%	<.0001
No	1283	3.80%	15.80%	80.40%	
Parents' knowledge of your donation attitude					
Yes	296	24.70%	37.30%	38.00%	<.0001
No	1250	1.90%	15.20%	82.90%	
Donation spouse/family					
Yes	817	9.40%	27.60%	62.90%	<.0001
No	706	2.70%	9.90%	87.40%	
Extreme sports					

	Overall	Owns Donor Card			P Value
		Yes	Wants One	No	
Yes	689	6.10%	22.00%	71.90%	NS
No	851	6.50%	17.40%	76.10%	
Motorcyclist					
Yes	313	8.70%	16.30%	75.00%	NS
No	1227	5.70%	20.30%	74.00%	
Accept organ for spouse/family					
Yes	1290	7.00%	21.80%	71.20%	<.0001
No	232	2.60%	8.20%	89.20%	
Accept organ for yourself					
Yes	1290	7.10%	21.80%	71.10%	<.0001
No	240	2.50%	7.50%	90.00%	
Accept organ for your child					
Yes	1403	6.60%	20.70%	72.60%	<.0001
No	125	3.20%	7.20%	89.60%	

Abbreviation: NS, not significant.

Table 4
Predictors of Having or Wanting a Donor Card in Multiple Logistic Regression

	Automated Stepwise Backward Selected Model		Model After Dropping of the 4 Weakest (Non-Significant) Predictors	
	OR	(95% CI)	OR	(95% CI)
German-speaking region	0.74	(0.52–1.04)		
School/academic occupation	1.58 [*]	(1.17–2.12)	1.76 [†]	(1.32–2.34)
Any religion	0.73	(0.53–1.01)		
Organ donation is legitimate	3.77 [*]	(1.78–9.08)	4.48 [†]	(2.20–10.4)
I know about my parents' wishes	1.32	(0.91–1.88)		
My parents know about my wishes	5.95 [†]	(4.16–8.55)	7.11 [†]	(5.18–9.81)
I would donate a next-of-kin's organs	2.91 [†]	(2.11–4.03)	3.15 [†]	(2.31–4.33)
I would accept an organ for myself	1.61	(0.91–3.01)		
	AIC: 1199		AIC: 1204.2	

Abbreviations: OR, odds ratio; CI, confidence intervals (lower to upper); AIC, Akaike Information Criterion.

^{*} $P < .01$.

[†] $P < .001$, likelihood ratio test.