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## Research Article

# Design of an Educational Campaign Based on the Theory of Planned Behavior to Encourage People to Donate Organs: A Study Protocol

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In all countries, organ donation shortage is a concern and there is a huge difference between the number of organs available for transplant and the numbers of potential recipients on waiting lists. The authors of this protocol, intend to design an educational intervention based on the theory of planned behavior (TPB) to encourage people over 18 years old to become an organ donor. This is the protocol of a campaign that will be carried out in three phases in Sirjan city, located in southern Iran. Initially an educational campaign will be designed, then it will be implemented, and eventually the educational campaign will be evaluated. In order to evaluate the effect of the campaign, a researcher-made questionnaire will be designed based on the theory of planned behavior and after a detailed literature review and inquiring the opinion of experts. The findings of this study will provide valuable evidences regarding the efficacy of the educational campaign on the intension of people to donate organs.

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The kidney, heart, liver, lung, intestine, pancreas and cornea are the most important transplanted organs (Chandler et al., 2017). In most cases, organ donation takes place when the donor is brain dead (Walker and Sque, 2016).

## 1. Background

One of the important achievements in modern medicine is the process of transplanting organs and body tissues (McGlade and Pierscionek, 2013). In all countries, organ donation shortage is a concern (Lewis et al., 2021) and there is a huge difference between the number of organs available for transplant and the numbers of potential recipients on waiting lists (Mahdi et al., 2023).

Donating organs from brain-dead people is a sacred phenomenon that involves various medical, social, religious and even economic aspects in a way that few other phenomena can be compared with. From the medical point of view, organ donation and organ transplantation are among the most advanced medical procedures (Schick Tanz and Wöhlke, 2017).

The global statistics about organ donation from brain dead patients is 20 per one million people. In a

country like Spain, which has the highest number of organ donations from brain dead patients, this rate is close to 34.3 per one million people. Brazil and Luxembourg, respectively, with 9.9 and 6 per one million people, are at the bottom of the list. Organ donation from brain dead patients in Iran is 14.34 per one million people, and this index in Sirjan city is 6.2 per one million people [5] which is much lower than the national average.

Every year, 5–8 thousand people encounter brain death in Iran, of which 2,500 to 4,000 have organs that can be donated. This is while in every 10 minutes one person is added to the organ transplant waiting list (Talebi Doluee et al., 2020). Each brain dead person can save 8 lives. There are 27,000 patients in Iran who need organs, and 7 to 10 people die every day due to the lack of an organ to transplant in Iran [3].

Organ transplantation saves the lives of thousands of people around the world, but at global level, only about 50% of brain death patients donate their organs (Ramadurg and Gupta, 2014). The process of organ donation is different in different countries. In some countries such as Iran, before death, a person consents to donate his body organs in case of brain death, by obtaining an organ donation card, or the family members of the brain-dead patients give consent for the person's organs to be donated.

In order to increase the satisfaction of family members to agree with organ donation, it is very important for family members to be aware of the person's decision about donating organs, and know about the person's donor card (Hyde and White, 2013). People's participation in social activities, including voluntary donations, is influenced by their opinions, beliefs, motivation and awareness. Beliefs and convictions of each person are also directly influenced by the environment in which a person has grown up in (Atik et al., 2019).

The basics of health communication are frequently used to design educational interventions that lead to changes in behavior (Sadeghi et al., 2020a). Health campaigns are one of these educational interventions (Stellefson et al., 2020) and can convey encouraging messages to persuade people to perform a specific behavior (Sadeghi et al., 2021). Among education interventions, campaigns have the highest penetration to audiences (Sadeghi et al., 2020b). Campaigns transfer specific messages, through various multiple communication channels, to a specific population, in a specific and limited period, and in line with the goals of the educational program (Waisbord, 2020). Campaigns also play a

significant role in creating a health culture (Sadeghi et al., 2019b), changing norms and wrong behaviors, or promoting healthy practices and behaviors (Sadeghi et al., 2020b). Many health campaigns are designed based on a strong theoretical foundation. This issue is also present in organ donation campaigns<sup>12</sup>.

According to the theory of planned behavior (TPB), intention to perform a behavior is predicted by three factors (Knowledge, Attitudes, Intention towards behavior, Behavior, Subjective norms, Normative beliefs, Control beliefs, and Perceived behavioral control). The meaning of "attitude towards the behavior" is to what extent the desired behavior is desirable, pleasant, useful or enjoyable for the person; which depends on the individual's judgment about the effects and consequences of the behavior. Subjective norms are the amount of social pressure perceived by the individual to perform the behavior and in other words is a reflection of social influence and influence on the individual. Perceived behavioral control is a degree of the individual's feelings and to what extent he/she is under voluntary control regarding doing or not doing a behavior. Perceived behavioral control can influence behavior both directly and indirectly through intention [10].

In the process of attracting people to voluntary organ donation, identification of people's attitudes and beliefs plays a central role. The attitude towards behavior is determined by a person's personal belief about the result of that behavior. Having a positive attitude towards a social issue can turn into a positive social behavior. On the other hand, having a negative attitude may prevent a person from performing an action (Azizi and Ahmadi, 2014).

Studies have used the planned behavior model for organ donation, and reported that behavioral beliefs and subjective norms were the direct predictors of organ donation. Also important people, including family, influenced the decision to donate organs (Tinning et al., 2021). According to the Karam et al. study, holding training courses, creating sensitivity among people and attracting the support of officials can improve the effectiveness of organ donation interventions (Alishan Karami et al., 2021).

All around the world and even developed countries, many people do not easily agree with organ donation (Lewis et al., 2021). Therefore, building the culture, providing information and raising awareness is necessary. The purpose of this protocol is to design an educational campaign based on TPB to encourage people to donate their organs.

## 2. Methods

This is the protocol of an interventional study that will be conducted for promoting organ donation. This study will be carried out in Sirjan, Kerman province, southwest of Iran. The population under study will include people over 18 years old. This study will be implemented in three phases.

1. Designing an educational campaign
2. Implementing the educational campaign
3. Evaluating the educational campaign.

### 2.1. Aim

The aim of this study is to design, execute and evaluate an educational campaign based on TPB, to encourage people over 18 years old to join the organ donation volunteer center.

Furthermore, the aim is to raise people's knowledge, change their perceptions, and improve their behavior towards organ donation. Hopefully this campaign will encourage people to donate organs and will improve the culture of this behavior in Sirjan, Iran.

### 2.2. Research hypotheses

The researchers hypothesize that after the campaign, the mean scores of the TPB constructs, and the number of organ donors will increase.

### 2.3. Phase I: Designing an educational campaign

#### 2.3.1. Study environment and population

This campaign will be conducted in the health centers, Friday prayers, mosques, schools, shopping centers, offices, universities, and entertainment centers of Sirjan, in Kerman province, Iran. In these places, training, persuasion and recruitment of people for membership in the organ donation campaign will be done by trained executive teams.

#### 2.3.2. Determining the name and logo of the campaign

This campaign will send specific, sequential and repeatable messages to targeted audiences through mass communication tools and influential media. Therefore, the structure of the messages plays a significant role in the success of the campaign. Also, the name of the campaign and its logo is influential

and gives direction to the campaign and its messages (Sadeghi et al., 2020a).

To determine the name of this campaign, various suggestions were given by the target group, but after investigation and gathering the opinion of 12 experts in a focus group discussion, the name of the campaign was chosen as "Organ Donation, Long Lasting Sacrifice". The campaign logo was also designed during a call (logo design contest). The campaign logo was chosen from 20 submitted works, in a meeting and based on the majority of votes (Figure 1).



Figure 1. Campaign name and logo

#### 2.3.3. Sampling method

In addition to the mass teaching events, a list of comprehensive health centers in Sirjan will be inquired. Then four centers will be chosen by random. After going to the selected centers, a list of participants will be extracted from the household files by random. These participants will complete a questionnaire one before the start of the campaign and later after the campaign is finished.

#### 2.3.4. Inclusion criteria

These participants have to be between 18 to 70 years old, able to understand the questions and consent to participate in the study.

### 2.3.5. Exclusion criteria

Participants will be excluded if they have a malignant disease, hepatitis B, hepatitis C, and AIDS, if they are under 18 or over 70 years old, or unwilling to cooperate in the research.

### 2.3.6. Data collection method

The data collection tool will be a questionnaire including demographic information and questions related to the TPB structures (Knowledge, Attitudes, Intention towards behavior, Behavior, Subjective norms, Normative beliefs, Control beliefs, Perceived behavioral control). The participants will complete the questionnaires themselves, and a trained research assistant will complete the questionnaire for those who are illiterate or have low-literacy.

### 2.3.7. Validity and Reliability

The questionnaire will be made by the researchers, after reviewing the relevant texts, articles and literature. The face validity of the questionnaire will be reviewed by a panel of experts. For this purpose, the questionnaire will be sent to 10 professors<sup>4</sup> health education and health promotion experts, 2 public health experts, 3 psychologists and 1 surgeon. To determine the content validity ratio (CVR), a group of experts (10 people) will be asked to review each question based on a 3-point scale (it is necessary=3, it is useful but not necessary=2, it is not necessary=1); and then we will calculate the CVR based on the formula below.

A CVR higher than 0.79, will be considered acceptable (Almanasreh et al., 2019). To check the content validity index (CVI), 3 criteria of simplicity, specificity and clarity for each of the questions will be examined based on a 4-point scale. Then the content validity index score will be calculated by aggregating the scores for each question that has been ranked 3 or 4 (acceptable) and dividing it by the total number of experts. If the CVI of a statement is 0.79 or above, that statement will remain in the questionnaire (Baghestani et al., 2019).

In order to determine the reliability, the modified questionnaire will be distributed among 15–30 people who are similar to the study group and the Cronbach's alpha coefficient will be estimated. Cronbach's alpha coefficients above 0.7 will be considered acceptable.

### 2.3.8. Designing and adapting educational material

Based on the results of previous studies, educational material will be designed and their readability and appropriateness will be checked, by the Readability Assessment of Materials (RAM) method (Sadeghi et al., 2019a). Suitability Assessment of Materials (SAM) will be used to evaluate the appropriateness of the content (Sousa et al., 2015).

The designed campaign messages will be distributed through mass media, health workers (thorough conducting training sessions for the target group and attracting their participation), presentations with PowerPoint in training sessions of health centers, visiting the workplaces or gatherings (in the meeting halls of the city, mosques and places of Friday prayers), installing banners and posters at designated points or billboards throughout the city, distributing pamphlets (in crowded urban places and also after training sessions), sending text messages, and forming telegram (or other social groups) for three months (Table. 1).

Activity	Timeline in Months											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Proposal writing and approval												
2. Building the questionnaire and determining its validity and reliability												
3. Determining the name and logo of the campaign												
4. Determining the current situation (through a survey).												
5. Formation of planning teams (advocacy) and operational teams												
6. Designing and tailoring educational materials												
7. Implementation of the organ donation campaign for three months												
8. Determining the current situation after the organ donation educational campaign by a second survey												
9. Evaluating the final result of the campaign												

**Table 1.**

### 2.3.9. Campaign activities and Participation

Campaign activities include two components:

1. Strengthening collective action and attracting the participation of cooperating organizations by holding joint meetings to increase inter-sectoral cooperation and coordinated action among health-related organizations. For this purpose, the representatives of the involved departments

and organizations will be invited to participate in joint meetings to determine the duties of each department regarding the campaign in the city.

2. Holding briefing training sessions by the University of Medical Sciences authorities for the personnel involved in the implementation of the campaign. This action aims to increase social support for the implementation of the campaign at health centers and local communities and will be implemented with the participation of health liaisons and trained facilitators.

The participating organizations are the City Council, the office of the Friday prayer leader, the Islamic Council, the Sirjan Department of Education, the

Sirjan Municipality, The Sirjan Department of Islamic Culture and Guidance, the local newspapers, the Broadcasting organizations, the Vice-Chancellor of Health and the Vice-Chancellor of Treatment at the Sirjan School of Medical Sciences, Gol Gohar Mineral Complex, Meraj Andisheh Organization, Majme Khayrin charity, Nikan charity and the Iranian Red Crescent.

Also, community members consisting of trusted representatives of the people, civil volunteers, working local clergymen in mosques, health liaisons, health workers and representatives of the target group (consisting of young people, students and volunteers) will be asked to cooperate (Table 2).

Number	Partner's names	Expectations
1	City Council	Mentioning the campaign in the city's health committee, monitoring the performance of partner departments in the campaign, financial and executive support for the campaign
2	The office of Friday prayer leader	Participation in the coordination meetings, spiritual support of the campaign, informing people in the Friday prayer, coordination with the clerics working in the mosques
3	City Islamic Council	Participation in coordination meetings, coordination in installing banners and posters, financial support in the implementation of the campaign
4	Education ministry	Participating in coordination meetings, issuing permission to hold training classes for training coaches, providing information in schools, financial support in the implementation of the campaign.
5	Municipality	Issuing permission to install advertising banners and posters in the city streets and parks, executive support of the campaign
6	Department of Islamic Culture and Guidance	Participating in coordination meetings, installing advertising banners and posters in the city, helping in holding training sessions
7	Local newspaper	Publishing educational articles about the organ donation campaign, interviewing experienced people and reflecting their experience in newspapers, news coverage of the campaign activities.
8	The radio and television broadcasting organization	News coverage of the campaign, broadcast of educational programs regarding the implementation of the campaign
9	Vice-Chancellor of Health and Vice-Chancellor of Treatment	Designing and then distributing campaign training packages, asking medical school professors to teach in health centers
10	Gol-e Gohar Mineral Complex & Meraj Andisheh organization	Participation in community education, holding health exhibitions, financial support
11	Iranian Red Crescent	Participation in community education, holding health exhibitions, financial support
12	Health workers	Planning, implementation and evaluation of the educational campaign activities include: training participating members, designing and printing material required for the training campaign, supervising the correct implementation of the campaign, monitoring and evaluation of the proceedings
13	Health and charity associations	Participation in community education, holding training sessions, financial participation
14	Local clerics in mosques and youth of the mosques	Encouraging participation of mosque visitors, installation of banners and posters, distribution of pamphlets and brochures
15	Nikan charity	Participation in community education, holding training sessions, financial participation
16	Civil volunteers	Participation in community education, banner and poster installation, pamphlet and brochure distribution

Table 2.

### 2.3.10. Outcome measures

The primary outcome will be the change in the number of organ donors, and the score of intention and behavior. The secondary outcome will be the change in the TPB constructs (including Knowledge, Attitudes, Intention towards behavior, Behavior, Subjective norms, Normative beliefs, Control beliefs, and Perceived behavioral control).

Variable		Scale	Sample questions
Primary outcome	Intention	1 (Strongly disagree) to 5 (Strongly agree)	I have decided to become a member at the organ donation center.
	Behavior	Yes 1, No 2	I am a member at the organ donation center.
	Number of volunteers 6 months after the end of campaign	Frequency	-
Secondary outcome variables	Knowledge	Yes 3, I don't know 2, No 1	Do you know about the organ donation card?
	Attitudes	1 (Strongly disagree) to 5 (Strongly agree)	Organ donation is a humanitarian act.
	Subjective norms	1 (Strongly disagree) to 5 (Strongly agree)	Parents' opinion is important for me to receive an organ donation card.
	Normative beliefs	1 (Strongly disagree) to 5 (Strongly agree)	I accept the opinion of my parents regarding membership in the organ donation center.
	Control beliefs	1 (Strongly disagree) to 5 (Strongly agree)	Membership or non-membership in the organ donation center is completely under my control.
	Perceived behavioral control	1 (Strongly disagree) to 5 (Strongly agree)	It is up to me to make a decision about organ donation.

**Table 3.**

### 2.3.11. Sample size

Assuming that 10% of the people living in Sirjan have an organ donation card, if we aim for a 5% increase in the percentage of organ donors, and according to the sample size equation for changes in percentages, with  $\alpha=0.05$  and  $\beta=0.20$ , a sample size of at least 686 people will be needed.

Due to the use of cluster sampling in this study, the design effect equal to 1.5 will be used. Considering this value, the required sample volume will be equal to 1029. Assuming a 20% attrition in the samples, the sample size is considered to be 1235 people.

### 2.3.12. Data analysis

Descriptive and inferential statistical methods will be used to describe and analyze data. Data will be presented as mean (standard deviation) for quantitative data and frequency (percentage) for qualitative data. The normality of data distribution will be checked using the Kolmogorov-Smirnov test. Data analysis will be done using paired t-tests (or its non-parametric counterpart), and conditional logistic regression analysis (to determine predictors of behavior).  $p<0.05$  will be considered as the

significance level and SPSS software (version 24) will be used for analysis.

## 3. Discussion

Various models have been proposed to explain the behavior of organ donors. Many researchers have used the (TPB) model for this purpose (Bresnahan et al., 2007, Hyde et al., 2013). Some researchers have concluded that in addition to attitude and intention, there are several other factors that determine organ donation (Bresnahan et al., 2007, Hyde and White, 2009, McMahon and Byrne, 2008, Park and Smith, 2007). Indirect predictors of organ donation, and attitude and intention included demographic factors, cultural differences, religiosity, social understanding and personality factors. Direct predictors of organ donation included behavioral beliefs, normative beliefs, self-efficacy, past behavior, direct experience, emotional reactions, social representations, identity, and moral norms (Nguyen et al., 2018, Parkinson et al., 2018, Shepherd and O'Carroll, 2014, Ghaffari et al., 2018, Hyde et al., 2013). According to research conducted outside Iran, behavioral beliefs and subjective norms and the influence of important people, including the family, play a significant role in the decision to donate organs (Ghaffari et al., 2018, Ghaffari et al., 2019, Lei et al., 2020, Hyde et al., 2013, Agarwal et al., 2018).

This theory-based intervention will be conducted to evaluate the efficacy of an educational campaign based on TPB on the intention of people to volunteer to donate organs. And will also assess the effect of the campaign in improving people's knowledge and their TPB constructs (attitude towards behavior and behavioral beliefs, subjective norms, perceived behavioral control, behavioral intention and behavior) regarding organ donation in Sirjan, Iran.

To date, few studies have focused on organ donation in Sirjan and other provinces of Iran. Moreover, there are few studies about using theory based campaigns to address knowledge, attitude, and behavior related to organ donation.

This theory-based, multi-component intervention will take into account a range of multiple factors affecting organ donation, and will hopefully increase organ donations, and save the lives of people waiting for organ transplants. In Salim et al.'s study about increasing organ donation among Hispanic Americans, interventions began in 2007 and were completed by 2012, and from 268 potential donors, 155 donors in which 106 were Hispanic Americans

provided consent during this period. This study showed that educational programs can reduce the difference between the number of donated organs and the number of organs needed by recipients, by improving the willingness to donate organs in the target group (Salim et al., 2014).

A pilot study in Australia conducted three interventions to increase people's consent for organ donation in 2013. This motivational intervention included 1- planned behavior (strengthening intention through attitudes, control and mental norms), 2- voluntary interventions using structures from the health action process approach (strengthening the transformation of intentions into action using action plans and coping plans), and 3- a combination of reinforcing (motivational) intentions as well as formulating specific action (when, where, how and with whom to discuss) and voluntary coping (listing potential barriers and how to overcome them). These programs resulted in significantly higher rates of self-reported organ donation intentions(9).

We hope that the findings of this study will provide valuable evidence regarding the efficacy of this educational campaign based on TPB on organ donation in Sirjan, Iran.

Educational campaigns are usually cost effective and can be extended to other similar populations in the world.

### 3.1. Limitations

One of the limitations of this study is that except people with low literacy, participants are expected to fill out the questionnaire themselves. Another limitation of this study is the lack of a control group, which is due to the nature of the campaign in which information and messages are sent to the target population through multiple channels, and it is not possible to have a fair control group.

## Statements and Declarations

### *Ethics approval and consent to participate*

Ethical approval for this study has been obtained by the Ethics Committee of Sirjan School of Medical Sciences, Sirjan, Iran (Ethical Code IR.SIRUMS.REC.1401.007).

### *Funding*

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### *Author contributions*

RS, NK developed the study concept and all authors further developed the study protocol. MM, SAR and RS are responsible for the implementation of the intervention. NK, MM and RS drafted protocol and will draft the study manuscript. All authors contributed to the proposal and will contribute to the final manuscript.

### *Declaration of Competing Interest*

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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## References

- AGARWAL, T. M., SINGH, R., AL THANI, H. A. S., AL MASLAMANI, Y., EL-MENYAR, A. & MEKKODATHIL, A. A. 2018. Perception of healthcare workers about barriers impacting organ donation in Qatar: A focus group study. *Open Science Journal*, 3.
- ALISHAN KARAMI, N., ETEMADI, Z., POOZESH, M., ROFAN, A., AZAD, M. & SHAHI, M. 2021. A training course of organ donation following brain death: A quasi-experimental study of knowledge, attitude and practice of healthcare staff in Hormozgan. *Development Strategies in Medical Education*, 8, 57-66.
- ALMANASREH, E., MOLES, R. & CHEN, T. F. 2019. Evaluation of methods used for estimating content validity. *Research in social and administrative pharmacy*, 15, 214-221.
- ATIK, B., KILINC, G., ATSAL, A. Ö., ÇÖKEN, F. & YARAR, V. Our brain death and organ donation experience: Over 12 years. *Transplantation Proceedings*, 2019. Elsevier, 2183-2185.
- AZIZI, S. & AHMADI, A. 2014. Evaluating and comparing behavioral intention towards blood donation in ladies through reasoned action and planned behavior theories. *Scientific Journal of Iran Blood Transfus Organ*, 11, 239-246.



- BAGHESTANI, A. R., AHMADI, F., TANHA, A. & MESHKAT, M. 2019. Bayesian critical values for Lawshe's content validity ratio. *Measurement and Evaluation in counseling and Development*, 52, 69–73.
- BRESNAHAN, M., LEE, S. Y., SMITH, S. W., SHEARMAN, S., NEBASHI, R., PARK, C. Y. & YOO, J. 2007. A theory of planned behavior study of college students' intention to register as organ donors in Japan, Korea, and the United States. *Health communication*, 21, 201–211.
- CHANDLER, J. A., CONNORS, M., HOLLAND, G. & SHEMIE, S. D. 2017. “Effective” requesting: a scoping review of the literature on asking families to consent to organ and tissue donation. *Transplantation*, 101, S1–S16.
- GHAFFARI, M., LATIFI, M., ROCHELEAU, C., NAJAFIZADEH, K., RAKHSHANDEROU, S. & RAMEZANKHANI, A. 2018. Using the theory of planned behavior framework for designing interventions related to organ donation. Springer.
- GHAFFARI, M., RAKHSHANDEROU, S., NAJAFIZADEH, K., RAMEZANKHANI, A. & LATIFI, M. 2019. Determinants of medical students for intention to organ donation: Application of theory of planned behavior. *Saudi Journal of Kidney Diseases and Transplantation*, 30, 1375–1380.
- HYDE, M. K., KNOWLES, S. R. & WHITE, K. M. 2013. Donating blood and organs: using an extended theory of planned behavior perspective to identify similarities and differences in individual motivations to donate. *Health education research*, 28, 1092–1104.
- HYDE, M. K. & WHITE, K. M. 2009. To be a donor or not to be? Applying an extended theory of planned behavior to predict posthumous organ donation intentions. *Journal of Applied Social Psychology*, 39, 880–900.
- HYDE, M. K. & WHITE, K. M. 2013. A test of three interventions to promote people's communication of their consent for organ donation. *Psychology & health*, 28, 399–417.
- LEI, L., LIN, L., DENG, J., DONG, H. & LUO, Y. 2020. Developing an organ donation curriculum for medical undergraduates in china based on theory of planned behavior: a delphi method study. *Annals of transplantation*, 25, e922809–1.
- LEWIS, A., KOUKOURA, A., TSIANOS, G.-I., GARGAVANIS, A. A., NIELSEN, A. A. & VASSILIADIS, E. 2021. Organ donation in the US and Europe: The supply vs demand imbalance. *Transplantation Reviews*, 35, 100585.
- MAHDI, S., MARZIEH, L., HABIB, R., ELAHE, P. & SANAZ, D. 2023. The role of healthcare professionals to improve organ donation and transplantation outcome: a national study. *Cell and Tissue Banking*, 1–7.
- MCGLADE, D. & PIERSCIONEK, B. 2013. Can education alter attitudes, behaviour and knowledge about organ donation? A pretest–post-test study. *BMJ open*, 3, e003961.
- MCMAHON, R. & BYRNE, M. 2008. Predicting donation among an Irish sample of donors and nondonors: extending the theory of planned behavior. *Transfusion*, 48, 321–331.
- NGUYEN, A. Q., ANJUM, S. K., HALPERN, S. E., KUMAR, K., RASMUSSEN, S. E. V. P., DOBY, B., SHAFFER, A. A., MASSIE, A. B., TOBIAN, A. A. & SEGEV, D. L. 2018. Willingness to donate organs among people living with HIV. *Journal of acquired immune deficiency syndromes (1999)*, 79, e30.
- PARK, H. S. & SMITH, S. W. 2007. Distinctiveness and influence of subjective norms, personal descriptive and injunctive norms, and societal descriptive and injunctive norms on behavioral intent: A case of two behaviors critical to organ donation. *Human Communication Research*, 33, 194–218.
- PARKINSON, J., RUSSELL-BENNETT, R. & PREVITE, J. 2018. Challenging the planned behavior approach in social marketing: emotion and experience matter. *European Journal of Marketing*, 52, 837–865.
- RAMADURG, U. Y. & GUPTA, A. 2014. Impact of an educational intervention on increasing the knowledge and changing the attitude and beliefs towards organ donation among medical students. *Journal of clinical and diagnostic research: JCDR*, 8, JC05.
- SADEGHI, R., MAHMOODABAD, S. S. M., FALLAHZADEH, H., REZAEIAN, M., BIDAKI, R. & KHANJANI, N. 2019a. Readability and suitability assessment of adolescent education material in preventing hookah smoking. *International Journal of High Risk Behaviors and Addiction*, 8.
- SADEGHI, R., MASOUDI, M. R. & KHANJANI, N. 2020a. A Systematic Review about Educational Campaigns on Smoking Cessation. *The Open Public Health Journal*, 13.
- SADEGHI, R., MASOUDI, M. R. & KHANJANI, N. 2021. Health Communication Efforts to Reduce Hookah Use among Adolescents. *American Journal of Health Education*, 52, 127–136.
- SADEGHI, R., MAZLOOMY-MAHMOODABAD, S.-S., REZAEIAN, M., FALLAHZADEH, H. & KHANJANI, N.

- 2019b. The application of geographic information systems (ArcGIS) in selecting locations for installing banners and billboards in a health campaign. *Health education research*, 34, 532-541.
- SADEGHI, R., MAZLOOMY MAHMOODABAD, S. S., FALLAHZADEH, H., REZAEIAN, M., BIDAKI, R. & KHANJANI, N. 2020b. Hookah is the enemy of health campaign: a campaign for prevention of hookah smoking among youth. *Health promotion international*, 35, 1125-1136.
  - SALIM, A., LEY, E. J., BERRY, C., SCHULMAN, D., NAVARRO, S., ZHENG, L. & CHAN, L. S. 2014. Effect of community educational interventions on rate of organ donation among Hispanic Americans. *JAMA surgery*, 149, 899-902.
  - SCHICKTANZ, S. & WÖHLKE, S. 2017. The utterable and unutterable anthropological meaning of the body in the context of organ transplantation. *Dilemata*, 107-127.
  - SHEPHERD, L. & O'CARROLL, R. E. 2014. Do affective attitudes predict organ donor registration? A prospective study. *Journal of health psychology*, 19, 1329-1333.
  - SOUSA, C. S., TURRINI, R. N. T. & POVEDA, V. B. 2015. Tradução e adaptação do instrumento "suitability assessment of materials"(SAM) para o português. *Revista de Enfermagem UFPE on line*, 9, 7854-7861.
  - STELLEFSON, M., PAIGE, S. R., CHANEY, B. H. & CHANEY, J. D. 2020. Evolving role of social media in health promotion: updated responsibilities for health education specialists. *International journal of environmental research and public health*, 17, 1153.
  - TALEBI DOLUEE, M., KHALEGHI BEYGI, E., TOHIDI, T. & ABBASI, Z. 2020. Investigating the effect of interventions to increase the number of organ donations in brain deaths during the years 2016-18 in Mashhad University of Medical Sciences. *medical journal of mashhad university of medical sciences*, 63.
  - TINNING, E., BEDNALL, T. C., BOVE, L. L. & JORDAN, H. 2021. An Alternative Framing of Organ Donation Registration: The Collective Donor Behavioral Model. *Nonprofit and Voluntary Sector Quarterly*, 50, 531-550.
  - WAISBORD, S. 2020. Family tree of theories, methodologies, and strategies in development communication. *Handbook of communication for development and social change*, 93-132.
  - WALKER, W. & SQUE, M. 2016. Balancing hope and despair at the end of life: The contribution of organ and tissue donation. *Journal of Critical Care*, 32, 73-78.

## Declarations

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