Original Article

The Empathy Factor: The Role of Empathy in Knowledge, Attitude, and Practice of Organ Donation in India - A Crossectional, Observational Study

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Abstract

Background: Due to the scarcity of organs available for transplantation, several patients lose their lives each year. Increased awareness and positive attitudes alone may be insufficient to increase an individual's willingness to donate (i.e., the basic tenets of the knowledge-attitude-practice/KAP model). Therefore, it is pertinent to examine other psychological determinants that are associated with engaging in the altruistic/prosocial act of organ donation. **Objective:** To understand the association between empathy and KAP of organ donation in an Indian population. This pilot is the precursor to a larger project which aims to develop and test an empathy intervention to promote organ donation. **Methods:** Using a cross-sectional design, Indians ($N = 419$; female = 261; mean age = 28.48 years) aged 18 years and above were recruited using convenience sampling through an online survey. Questionnaires included the Awareness, Attitudes, and Practice of Organ Donation (Chakradhar *et al*., 2016) and Empathy Quotient-8 (Loewen *et al*., 2010). Multiple regression analyses were carried out to analyze the data. **Results:** Results showed that empathy was related to: (i) Total KAP ($\beta = 0.123$, $P = 0.014$), and (ii) attitudes ($\beta = 0.195$, $P < 0.001$) towards organ donation. **Conclusion:** These pilot study findings indicate that public health messages focused on evoking empathy can use the technique of patient/donor narratives, and training clinicians on empathic communication skills can help increase individuals' KAP of organ donation. Further, this pilot elucidated the need to conduct mixed-method studies with a donor and nondonor population and clinicians prior to developing and testing a larger empathy-centered intervention aimed at promoting the KAP of organ donation.

Keywords: Empathy, India, knowledge-attitude-practice, organ donation, pilot, transplantation

Introduction

Worldwide, and Indian, research predominantly uses the knowledge (refers to an assessment of factual information that individuals have about organs that can be donated and about concepts such as brain death, legislations facilitating donation and information on attaining donor cards), attitude (refers to perceptions and misconceptions pertaining to organ donation such as religious beliefs hindering or favoring donation, notions of possible disfigurement and fear surrounding organ donation), and practice (refers to concrete actions taken towards the decision to donate one's organs such as whether an individual has already donated their organs or made their decision known by registering or obtaining a donor card) (KAP) model of organ donation to understand the predictors of organ donation.[1,2] For example, Edmund *et al*. found that religion, birth order, and personality were predictors of organ donation among Malaysian medical students.[3] Given the predominance of the KAP approach to organ donation research, it is not surprising that the KAP-model continues to inform public policy and interventions as well.[4] Yet, research consistently shows that the KAP-model by itself may not be able to predict organ donation

Access this article online

Quick Response Code:

Website: www.ijtonline.in

DOI: 10.4103/ijot.ijot_64_21

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Received: 21 June 2021; **Revised:** 29 September 2021; **Accepted:** 17 October 2021; **Published:** 30 September 2022

How to cite this article: George P, Chittem M, Dwivedi R, Pal C, Guntupalli Y, Pati S, *et al*. The empathy factor: The role of empathy in knowledge, attitude, and practice of organ donation in India - A crossectional, observational study. Indian J Transplant 2022;16:274-81.

behavior. For instance, Sachdeva (2017) reported that although 53.1% of Indians were aware of and 58% had a positive attitude toward organ donation, 26.4% were willing to sign a pledge card to donate their organs.[5] Similarly, Annadurai *et al*. found that despite a favorable attitude towards organ donation, only few Indian college students were registered organ donors.[1] Indeed, recent research argues that organ donation decisions may not always be rational and cognitive factors, such as knowledge, are less influential in organ donation decisions compared to affective factors such as altruism/empathy.[6]

Empathy denotes the ability to relate to another individual's emotional state and take the individual's perspectives in a given situation.[7,8] More recently, empathy was expanded to include cognitive (e.g., perspective-taking) and affective (e.g., empathic concern) components and is considered a multidimensional construct.[7] In organ donation research, Cohen and Hoffner argue that the willingness to become an organ donor relies more on empathy and the altruistic intention to help another than on increased knowledge regarding organ donation.[9] Since the individual does not gain anything by donating their organs, organ donation is considered a selfless and altruistic act based on empathic concern for an individual in need.[9]

Despite several studies demonstrating a link between empathy and prosocial behaviors,[9,10] and the need to take into account psychological factors within the oft-utilized KAP-model of organ donation, research on empathy and the KAP-model is sparse and sporadic.[9] One of the earliest empathy interventions was carried out by Skumanich and Kintsfather (1996), who found that undergraduate students in the USA exposed to empathy arousing, persuasive organ donation messages had a higher behavioral intention to sign a donor card.[11] More recently, Milaniak *et al*. (2018) found that nursing and paramedical students in Poland who scored higher on dispositional empathy (empathic tendencies such as perspective-taking and empathic concern) had more favorable attitudes towards organ donation.[10] Similarly, individuals high in dispositional empathy were also more likely to agree to donate the organs of their deceased family members.[10] These studies suggest that individuals who are disposed to act empathetically tend to have more positive attitudes and behavioral intentions towards organ donation. However, no research has examined the link between empathy and knowledge of organ donation, a critical construct within the KAP-model of organ donation. In order to improve the relevance and utilization of the KAP-model for promoting organ donation, it is important to understand the role of empathy in relation to the total and individual constructs of the KAP.

To the best of our knowledge, no study in India examined the relationship between empathy and KAP regarding organ donation. The current study is a part of a larger project which aims to: (i) Develop an empathy intervention specifically for organ donation using the KAP framework, and (ii) test the effectiveness of this empathy intervention in the overall and individual KAP aspects of organ donation. The objectives of the present pilot study are to (i) examine the association between empathy and KAP of organ donation among the general public of India, and (ii) assess the relevance of the empathy approach to the KAP model.

Methods

Participants and procedure

The study design was cross-sectional, with participants recruited using convenience sampling via social networking sites and messaging apps (e.g., Facebook, Instagram). A total of 419 participants who met the inclusion criteria (i.e., 18 years and above, currently residing in India, with the ability to read and comprehend English) were recruited. Participants' sociodemographic details are provided in Table 1.

Questionnaires

Awareness, attitudes, and practice of organ donation (knowledge-attitude-practice)

This 14-item scale was adapted from the awareness, attitudes, and practice of organ donation questionnaire by Chakradhar *et al.* (2016).[12] Supplementary Table 1 provides the list of questions adapted from this scale. Responses were binary (i.e., yes/no). Cronbach's alpha for the scale was found to be 0.47 in this study.

Table 1: Sociodemographic profile of the participants

Characteristic	Mean/*n*	SD/percentage
Age (years)	28.48	10.53
Gender		
Female	261	62.30
Male	158	37.70
Level of education		
Postgraduation and above	195	46.50
Under graduation	199	47.50
Higher secondary	25	6.00
Occupation		
Student	275	65.60
Employed	107	25.50
Unemployed	27	6.40
Retired	10	2.40
Relationship status		
Single	265	63.20
In a relationship	44	10.50
Married	107	25.50
Divorced/widowed	3	0.70
Religion		
Hinduism	268	64.00
Islam	13	3.10
Christianity	93	22.20
Other minorities	13	3.10
Nonreligious	32	7.60
State		
North zone	21	5.00
South central zone	322	76.80
East zone	13	3.10
West zone	14	3.30
Northeast zone	43	10.30
Others	6	1.40

SD: Standard deviation

Empathy Quotient-8

This 8-item scale[13] was used to assess empathy with items scored 2, 1 or 0, indicating high, medium, and low empathy levels. Cronbach's alpha was found to be 0.60 in this study.

Statistical analysis

The statistical analysis for this pilot was carried out in four stages. First, descriptive statistics was used to present the socio-economic and demographic characteristics of the sampled population. Second, to understand the relationship between KAP and demographic variables and empathy, student *t* and analysis of variance with *post hoc* analysis was used for multiple comparisons. Third, a histogram comparing age to KAP was also depicted. Finally, multiple logistic regression (MLR) analysis was employed to identify the major determinants of KAP and empathy.

The MLR can be used to predict a categorical dependent variable on the basis of independents, and to determine the percent of the variance in the dependent variable explained by the independents; to rank the relative importance of independents, and to understand the impact of covariates. Maximum likelihood estimation after transforming the dependent into a logit variable (the natural log of the odds of the dependent occurring or not). Hence, MLR estimates the probability of certain events, whether occurring or not. The MLR can be noted as:

$$ln\left(\frac{p}{1-p}\right) = a = b_1x_1 + b_2x_2 + b_3x_3 + ...b_ix_i + e$$

Where P is the probability of possibility of high empathy $p_{(y=1)}$; $b_1 b_2, b_3, ...b_i$ refer to the beta coefficients; $x_1 x_2 x_3 .....x_i$ refer to the independent variables and e is the error term. Weighting has been applied to the current survey data for adjusting variations in the composition of population, to make the estimates nationally more representative. Data underwent consistency, logical, and range checks prior to analysis in STATA/SE version 14.0 STATACorp., College Station, Texas, USA.

Participant consent

The participant consent has been taken for participation in the study and for publication of clinical details and images. Participants understand that the names and initials would not be published, and all standard protocols will be followed to conceal their identity.

Ethics statement

Institutional Ethics Committee (IEC) of the Indian Institute of Technology Hyderabad (IITH) IEC Protocol No. IITH/IEC/2018/03/18. The study was performed according to the guidelines in Declaration of Helsinki. All protocols of Declaration of Helsinki were followed.

Results

The sociodemographic profile of the participants (mean age = 28.48 years, standard deviation = 10.53) and the associations with KAP and empathy are depicted in Tables 1 and 2, respectively. The descriptive statistics for the KAP and empathy items is provided in Supplementary Table 2. A histogram depicting the relationship between age and KAP is provided in Supplementary Figure 1. Four hundred and nineteen respondents were included for the present study, out of which, 261 (67.3%) were female and 158 (37.7%) were male. Majority of the participants were female (2/3rd) and about 94% respondents reported their education status to be up to graduation or postgraduation and above. Majority of the participants composed of students (66%), with the relationship status as single (63%), having religious affiliation with Hinduism (64%), and belonged to the Southern zone (77%).

Table 2 indicates that there was no significant difference ($P = 0.31$ and $P = 0.11$) as per the gender of respondents with KAP (*male* = 9.29 ± 1.89 and female = 9.45 ± 1.44) and empathy (*male* = 10.01 ± 2.66 and female = 10.36 ± 2.63). Similar results were observed for participants' occupation with KAP and empathy ($P = 0.73$ and $P = 0.12$). The relationship status and educational attainment have no association with KAP ($P = 0.37$ and $P = 0.35$). However, it was observed that the relationship status and educational attainment has a significant association with the level of empathy ($P = 0.00$). In addition, Supplementary Figure 1 shows the age distribution and correlation with KAP scores. Age was classified into three groups, i.e., 18–24 years (49%), 25–39 years (36%), and 40 and above (15%). The Pearson correlation coefficient value indicates a significant association between KAP score and age distribution ($R = 0.139$; $P < 0.01$).

An MLR was employed to examine the relationship between KAP and demographic variables and empathy [Tables 3-6]. Age was significantly related to KAP (β = 0.261, $P = 0.003$), with older individuals scoring significantly higher on KAP. Occupation was associated with KAP, with students scoring significantly higher than employed (β = −0.178, $P = 0.005$) and retired individuals (β = −0.143, $P = 0.026$). Empathy was also found to be associated with KAP (β = 0.123, $P = 0.014$), with individuals with higher empathy scoring higher on KAP.

Students had more positive attitudes towards organ donation compared to employed individuals (β = −0.218, $P = 0.001$). Empathy was also found to be linked to attitudes (β = 0.195, $P < 0.001$). Age was significantly associated with organ donation practice (β = 0.322, $P < 0.001$), with older adults scoring higher on practice behaviors. Males scored significantly higher on practice than females (β = −0.095, $P = 0.049$). The occupation was associated with practice, with students scoring higher than retired individuals (β = −0.145, $P = 0.020$).

Discussion

The present pilot study examined the relationship between empathy and KAP of organ donation in an Indian population. It was found that: (i) Age, occupation, and empathy were related to KAP, (ii) occupation and empathy predicted attitudes, and (iii) age, gender, and occupation were related to practice.

Table 2: Comparisons of sociodemographic characteristics between knowledge, attitude, and practice and empathy

Covariates	*n*	Mean±SD	*P*
Gender			
Knowledge			
Male	158	2.86±1.00	0.31
Female	261	2.96±0.92	
Attitudes			
Male	158	6.17±1.14	0.09*
Female	261	6.34±0.94	
Practice			
Male	158	0.26±0.49	0.11
Female	261	0.15±0.37	
KAP-total			
Male	158	9.29±1.89	0.33
Female	261	9.45±1.44	
Empathy			
Male	158	10.01±2.66	0.18
Female	261	10.36±2.63	
Education			
Knowledge			
Postgraduation and above	195	2.85±0.94	0.36
Under graduation	199	2.98±0.97	
Higher secondary	25	2.96±0.88	
Attitudes			
Postgraduation and above	195	6.39±0.92	0.04**
Under graduation	199	6.15±1.14	
Higher secondary	25	6.44±0.71	
Practice			
Postgraduation and above	195	0.25±0.45	0.02**
Under graduation	199	0.14±0.38	
Higher secondary	25	0.16±0.47	
KAP-Total			
Postgraduation and above	195	9.49±1.63	0.35
Under graduation	199	9.27±1.64	
Higher secondary	25	9.56±1.35	
Empathy			
Postgraduation and above	195	10.77±2.74	0.00***
Under graduation	199	9.74±2.35	
Higher secondary	25	9.88±3.33	
Occupation			
Knowledge			
Student	275	2.95±0.94	0.73
Employed	107	2.87±0.99	
Unemployed	27	2.78±0.97	
Retired	10	3.00±0.81	
Attitudes			
Student	275	6.33±0.96	0.23
Employed	107	6.12±1.21	
Unemployed	27	6.26±0.90	
Retired	10	6.60±0.51	
Practice			
Student	275	0.13±0.36	0.00***
Employed	107	0.35±0.55	
Unemployed	27	0.15±0.36	
Retired	10	0.20±0.42	
KAP-total			
Student	275	9.42±1.46	0.73
Employed	107	9.34±2.06	
Unemployed	27	9.19±1.49	
Retired	10	9.80±0.78	
Empathy			
Student	275	10.01±2.50	0.12
Employed	107	10.64±3.05	
Unemployed	27	10.59±2.20	
Retired	10	10.90±2.47	
Relationship status			
Knowledge			
Single	265	2.96±0.95	0.22
In a relationship	44	2.68±0.88	
Married	107	2.94±0.98	
Divorced or widowed	3	2.33±0.57	
Attitudes			
Single	265	6.24±1.07	0.68
In a relationship	44	6.34±0.86	
Married	107	6.35±0.98	
Divorced or widowed	3	6.67±0.57	
Practice			
Single	265	0.14±0.36	0.00***
In a relationship	44	0.16±0.42	
Married	107	0.33±0.52	
Divorced or widowed	3	0.33±0.58	
KAP-total			
Single	265	9.34±1.59	0.37
In a relationship	44	9.18±1.41	
Married	107	9.62±1.79	
Divorced or widowed	3	9.33±0.57	
Empathy			
Single	265	9.91±2.56	0.00***
In a relationship	44	10.84±2.72	
Married	107	10.70±2.72	
Divorced or widowed	3	12.33±1.15	
Religion			
Knowledge			
Hindu	268	2.96±0.93	0.22
Muslim	13	2.62±1.19	
Christian	93	2.95±0.99	
Other minorities	13	3.00±0.81	
Nonreligious	32	2.59±0.96	
Attitudes			
Hindu	268	6.43±0.84	0.00***
Muslim	13	5.69±1.70	
Christian	93	5.92±1.28	
Other minorities	13	6.31±0.63	
Nonreligious	32	6.31±1.06	
Practice			

Contd...

Contd...

Table 2: Contd...

Covariates	*n*	Mean±SD	*P*
Religion			
Hindu	268	0.22±0.46	0.38
Muslim	13	0.08±0.27	
Christian	93	0.13±0.33	
Other minorities	13	0.15±0.37	
Nonreligious	32	0.19±0.39	
KAP-total			
Hindu	268	9.61±1.43	0.00***
Muslim	13	8.38±2.18	
Christian	93	9.00±1.93	
Other minorities	13	9.46±1.05	
Nonreligious	32	9.09±1.80	
Empathy			
Hindu	268	10.29±2.72	0.04**
Muslim	13	10.54±3.30	
Christian	93	9.70±2.31	
Other minorities	13	9.85±2.15	
Nonreligious	32	11.28±2.58	
State-zone			
Knowledge			
South zone	313	2.99±0.95	0.52
West zone	14	2.93±0.99	
North zone	21	3.00±1.00	
Central zone	9	3.00±1.00	
East zone	13	2.62±0.65	
North east zone	43	2.49±0.96	
Other	6	2.67±0.81	
Attitudes			
South zone	313	6.41±0.86	0.00***
West zone	14	6.50±0.76	
North zone	21	6.33±0.91	
Central zone	9	6.67±0.50	
East zone	13	5.62±1.60	
North east zone	43	5.40±1.49	
Other	6	6.17±0.98	
Practice			
South zone	313	0.21±0.44	0.07*
West zone	14	0.29±0.46	
North zone	21	0.14±0.35	
Central zone	9	0.00±0.00	
East zone	13	0.00±0.00	
North east zone	43	0.09±0.29	
Other	6	0.50±0.83	
KAP-total			
South zone	313	9.61±1.48	0.00***
West zone	14	9.71±1.68	
North zone	21	9.48±1.77	
Central zone	9	9.67±0.86	
East zone	13	8.23±1.36	
North east zone	43	7.98±1.89	
Other	6	9.33±1.63	
Empathy			

Contd...

Table 2: Contd...

Covariates	*n*	Mean±SD	*P*
State-zone			
South zone	313	10.18±2.68	0.20
West zone	14	12.00±2.80	
North zone	21	10.24±2.25	
Central zone	9	11.00±2.73	
East zone	13	10.15±2.15	
North east zone	43	9.79±2.50	
Other	6	10.67±2.73	

*P<0.10, **P<0.05, ***P<0.01. KAP: Knowledge, attitude, and practice, SD: Standard deviation

For the purposes of this article, the link between empathy and KAP will only be discussed.

In the current pilot study, increased empathy was associated with increased levels of total KAP. This finding is in line with previous studies, which suggested that empathic concern predicted positive attitudes and a willingness to donate.[9-11] Particularly with living donation, the motivation to donate must override the immediate discomforts that individuals may undergo,[14] and this may be due to the empathic concern that the donor feels for the patient awaiting a transplantation. However, these results must be interpreted with caution, as KAP in the present study is an aggregate measure of the individual components of knowledge, attitude, and practice.

The association of empathy with positive attitudes towards organ donation is consistent with previous research suggesting that individuals higher in dispositional empathy were more likely to perceive organ donation positively.[10] In addition, research showed that empathic individuals held a more positive attitude towards organ donation due to their lack of perceived risk.[9] Since the present study consisted of primarily a student sample who were younger and less prone to health risks, they may have held more positive attitudes due to their lack of perceived risks associated with donation. Although empathy was shown to be linked to attitudes in this study, it is uncertain whether this relationship was mediated or moderated by other closely related psychological constructs such as personality, anticipated guilt, or personal values.

Despite evidence suggesting that empathy predicted organ donation intentions and willingness,[9-11] the present study could not find any association between empathy and practice. This may be because of the nature of the items used to measure practice in the current study. The items pertaining to practice assessed whether individuals had already donated an organ or signed a donor card and not whether they would be willing to do so in the future. Hence, the measure of practice used in this study (i.e., actual practice behaviors) may not be an accurate comparison to existing worldwide research (i.e., behavioral intentions and willingness) on donation. As positive attitudes are a precursor to behavioral intentions and actual behavior,[9] it is possible that practice behaviors of the current sample may change over time, especially since the current study's sample was mainly students.

Table 3: Multiple logistic regression analyses for variables predicting combined knowledge, attitude, and practice score

Predictor variables	*B*	SE (B)	β	*t*	*P*
Age	0.040	0.014	0.261	2.958	0.003**
Gender	0.186	0.166	0.056	1.125	0.261
Number of children	0.187	0.199	0.070	0.943	0.346
Employed (versus student)	−0.662	0.235	−0.178	−2.817	0.005**
Unemployed (versus student)	−0.639	0.336	−0.097	−1.902	0.058
Retired (versus student)	−1.518	0.678	−0.143	−2.238	0.026*
Postgraduation (versus higher secondary)	−0.177	0.357	−0.054	−0.496	0.620
Under graduation (versus higher secondary)	−0.257	0.341	−0.079	−0.753	0.452
Relationship status	0.164	0.201	0.049	0.818	0.414
Religion	0.345	0.301	0.056	1.145	0.253
Empathy	0.075	0.030	0.123	2.469	0.014*

*P<0.05, **P<0.01. SE: Standard error

Table 4: Multiple logistic regression analyses for variables predicting knowledge of organ donation

Predictor variables	*B*	SE (B)	β	*t*	*P*
Age	0.013	0.008	0.143	1.596	0.111
Gender	0.117	0.099	0.059	1.180	0.238
Number of children	0.157	0.119	0.100	1.327	0.185
Employed (versus student)	−0.216	0.140	−0.099	−1.542	0.124
Unemployed (versus student)	−0.275	0.201	−0.071	−1.370	0.172
Retired (versus student)	−0.609	0.405	−0.097	−1.503	0.134
Postgraduation (versus higher secondary)	−0.092	0.213	−0.048	−0.433	0.665
Under graduation (versus higher secondary)	0.039	0.204	0.021	0.194	0.847
Relationship status	0.178	0.120	0.089	1.483	0.139
Religion	0.287	0.180	0.080	1.596	0.111
Empathy	0.004	0.018	0.011	0.209	0.834

SE: Standard error

Table 5: Multiple logistic regression analyses for variables predicting attitudes towards organ donation

Predictor variables	*B*	SE (B)	β	*t*	*P*
Age	0.014	0.009	0.147	1.675	0.095
Gender	0.154	0.103	0.073	1.488	0.137
Number of children	0.064	0.124	0.038	0.519	0.604
Employed (versus student)	−0.511	0.146	−0.218	−3.490	0.001**
Unemployed (versus student)	−0.302	0.210	−0.073	−1.442	0.150
Retired (versus student)	−0.502	0.423	−0.075	−1.186	0.237
Postgraduation (versus higher secondary)	−0.052	0.222	−0.026	−0.236	0.814
Under graduation (versus higher secondary)	−0.227	0.213	−0.111	−1.065	0.288
Relationship status	−0.008	0.125	−0.004	−0.061	0.952
Religion	0.016	0.188	0.004	0.087	0.931
Empathy	0.075	0.019	0.195	3.956	0.000**

**P<0.01. SE: Standard error

Empathy was not related to knowledge in the present study. Studies examining the relationship between empathy and organ donation have only explored its influence on attitudes and behavioral intentions[9-11] and have not investigated its relationship with knowledge. One possible reason may be because KAP surveys which assess awareness (i.e., the knowledge component) require individuals to recall previously learned information on a health-related behavior such as organ donation. Retrieving previously encoded information in KAP surveys may activate a different cognitive pathway as opposed to the retention of new information. As patient perspectives have been successful in enhancing empathy and retention of new information among medical students,[15,16] organ donation campaigns can apply the same techniques to improve donation rates (i.e., empathy evoking personal narratives).

Implications

Since higher levels of empathy were observed to be linked to increased overall KAP and positive attitudes in the current pilot

Table 6: Multiple logistic regression analyses for variables predicting practice of organ donation

Predictor variables	*B*	SE (B)	β	*t*	*P*
Age	0.013	0.004	0.322	3.722	0.000**
Gender	−0.084	0.043	−0.095	−1.973	0.049*
Number of children	−0.034	0.051	−0.049	−0.673	0.501
Employed (versus student)	0.066	0.061	0.067	1.088	0.277
Unemployed (versus student)	−0.062	0.087	−0.035	−0.713	0.476
Retired (versus student)	−0.408	0.175	−0.145	−2.332	0.020*
Postgraduation (versus higher secondary)	−0.032	0.092	−0.037	−0.348	0.728
Under graduation (versus higher secondary)	−0.070	0.088	−0.081	−0.794	0.428
Relationship status	−0.006	0.052	−0.007	−0.116	0.908
Religion	0.041	0.078	0.026	0.533	0.595
Empathy	−0.004	0.008	−0.023	−0.475	0.635

*P<0.05, **P<0.01. SE: Standard error

study, public health efforts which speak to the empathic aspects of human life may be more effective in increasing the number of living and deceased organ donations. For example, empathy interventions including videos or pamphlets containing patient and donor narratives can help induce compassion which can, in turn, increase knowledge retention, improve attitudes, and facilitate better practice outcomes such as increased behavioral intentions to donate and the actual signing of donor cards. Similarly, clinicians can be introduced to communication skills which focus on: (i) Identifying and harnessing an individual's empathic concern to strengthen their attitudes and overall KAP regarding organ donation, and (ii) displaying/expressing compassion which might help individuals/eligible donors to model similar behaviors, thus offering more opportunities for them to consider organ donation favorably.

Insights obtained from the pilot will facilitate the researchers in structuring a larger study aimed at (i) developing an empathy intervention specifically for organ donation using the KAP model and (ii) testing the impact of this empathy intervention in overall and individual KAP aspects of organ donation. Based on the findings of this pilot, it is proposed to first develop an empathy-centered intervention focused on personal accounts of patients in need of organs and benefitted from organ donation, individuals who donated organs, clinicians who facilitated transplantation, and policymakers or non-governmental organizations who share factual knowledge regarding organ donation. The content of these accounts will target the overall KAP, with special emphasis on promoting and strengthening positive attitudes towards organ donation. In parallel, KAP and empathy questionnaires targeting a general population in India will be developed and tested for validity and reliability. Following this, it is proposed to use a longitudinal, mixed-method study (as opposed to a randomized control trial) so as to examine the impact of the empathy intervention on the overall and individual aspects of KAP of organ donation overtime.

Strengths and limitations

The study has several strengths. To the best of our knowledge, this is the first pan-India study to examine the association between empathy and KAP of organ donation. As the study was carried out via an online survey, it was possible to recruit participants from geographically diverse parts of the country. Second, the large sample size obtained for this pilot warrants that the insights and conclusions drawn can meaningfully aid in the development of the upcoming intervention study. Third, as most research on organ donation is limited to particular samples (e.g., students, patients, health professionals), the inclusion of the wider general public who are potential organ donors is seen as an advantage of this research. Finally, and most importantly, this is the first study in India which examined the role of empathy in the KAP-model of organ donation, thus offering critical insights into developing a unique empathy-focused intervention to promote organ donation in India.

These strengths notwithstanding, there are some limitations of this pilot study. First, owing to the cross-sectional nature of the study design, it is difficult to assess the impact of empathy on KAP or if this relationship is likely to change over time. Future research should adopt a randomized control trial, vignette, or longitudinal design to ascertain this impact or any subsequent changes. Second, the study sample has a large student cohort which may have influenced the reliability estimates of the KAP measure, thus making interpretations of some of the findings difficult. Third, the study examined donation in relation to any organ, i.e., it did not focus on a specific organ. Fourth, the study did not make any distinction between deceased and living donation. Fifth, the quantitative nature of the study makes it challenging to unpack the lived experiences, personal narratives and cultural underpinnings linked to organ donation. Sixth, this pilot study included only a general population which had not engaged in the practice of organ donation, thus not providing insight into the empathy-KAP relationship among those who either donated or possessed an organ donor card. Similarly, this pilot did not take into account the perspectives of clinicians who may have to engage in medical discussions on organ donation (e.g., nephrologists). Finally, the reliability scores for the KAP questionnaire is poor, suggesting that this scale is a poor discriminant and the findings of this pilot study need to be interpreted with care. Importantly, this brings to light the need to develop reliable scales to measure KAP for a range

of Indian populations as well as for the larger intervention study for which the current study was a pilot. Taking into consideration these limitations, and before engaging in the larger intervention study, the authors will conduct mixed-methods studies using a vignette and qualitative design to better understand the role of empathy in relation to KAP among a representative sample Indian donors, nondonors, and clinicians.

Conclusion

The present pilot study was the first to examine the association between empathy and KAP of organ donation among the general public of India. Results revealed that empathy was associated with total KAP and attitudes toward organ donation. In order to promote overall and individual KAP of organ donation, clinicians need to be trained in empathic communication skills, and public health messages aimed to persuade individuals to donate should focus on using patient narratives as a technique to evoke empathy. Finally, this pilot study sheds light on the next steps of the larger study, including conducting a mixed-method study to examine the role of empathy in the KAP-framework, which will, in turn, aid in designing and testing an empathy intervention to promote organ donation.

Acknowledgements

We thank Ms. Shweta Chawak for the initial support with the study development and data analysis.

Financial support and sponsorship

UGC and MHRD.

Conflicts of interest

There are no conflicts of interest

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Table S1: Knowledge, attitude, and practice of organ donation scale^

Knowledge

1. Have you heard of the term "organ donation?"
2. Have you heard of the term "organ transplantation?"
3. Are you aware of "transplantation of human organs act?"
4. Do you know where to obtain organ donation cards?
5. Can a brain-dead patient's organs be donated?
6. Will certified brain-dead registered organ donor be immediately disconnected from ventilation support?
7. Can parents/guardians make substitute decision making for mentally disabled persons in the regard of organ donation?
8. Donor's and recipient's blood group must be matched?
9. Donor's human leukocytes antigen must be identical to that of the recipient for any organ transplantation?
10. Hepatitis B and C carriers can donate all of their solid organs except the liver organs?
11. Malignancy is always a contraindication to cadaveric organ do- nation?
12. Increased risk of opportunistic infections is a common complication to all transplantations?
13. Organ transplant recipients are more prone to developing of cancer after transplantation?

Attitude

14. Do you support organ donation?
15. Do you feel comfortable to think or talk about organ donation?
16. Do you agree to donate organs when you die?
17. Do you agree to donate your family member's organs?
18. Does your family agree with organ donation?
19. Do you think donating one's organ adds meaning to one's life?
20. Does your religion agree with organ donation or transplantation?
21. Do you have belief that your body should be kept intact after death?
22. Do you have fear that your body will be disfigured, if you donate organs?
23. Do you think there will be premature termination of medical treatment for registered organ donors?
24. Do you think live organ donation is better than cadaveric organ donation in solving shortage?

Practice

25. Have you pledged/signed to donate an organ?
26. Have you ever donated an organ?
27. Did you ever receive an organ for transplantation?

^This study adapted the Chakradhar *et al*. (2016) scale based on a pilot study (n=5) aimed at assessing the scale's relevance for a general public and likelihood of responding to the full questionnaire. Consequently, in the knowledge domain of the full scale, items 2 and 6-12 were excluded as these were technical and may be better understood by a medical professional/students rather than a general population. In the attitude domain, items pertaining to one's own decisions were included while items 17 and 18 measuring attitudes towards donating their family members' organs were excluded as well as items 23 and 24 which were technical and may not be understood by a general population. In the practice domain, item 27 which was aimed at a patient population was excluded. Therefore, the final adapted scale included all the items marked in black (*i.e*., items 1, 3-5, 13-16, 19-22, 25-16)

Table S2: Descriptive statistics for knowledge, attitude, practice, empathy items

Items	*n* (%)
Knowledge	
Have you heard of the term "organ donation?"	
Yes	415 (99.05)
No	4 (0.95)
Are you aware of "transplantation of human organs act?"	
Yes	254 (60.62)
No	165 (39.38)
Do you know where to obtain organ donation cards?	
Yes	89 (21.24)
No	330 (78.76)
Can a brain-dead patient's organs be donated?	
Yes	372 (88.78)
No	47 (11.22)
Are organ transplant recipients more prone to developing cancer after transplantation?	
Yes	99 (23.63)
No	320 (76.37)
Attitude	
Do you support organ donation?	
Yes	413 (98.57)
No	6 (1.43)
Do you feel comfortable to think or talk about organ donation?	
Yes	401 (95.70)
No	18 (4.30)
Do you agree to donate organs when you die?	
Yes	366 (87.35)
No	53 (12.65)
Do you think donating one's organ adds meaning to one's life?	
Yes	389 (92.84)
No	30 (7.16)
Does your religion agree with organ donation or transplantation?	
Yes	351 (83.77)
No	68 (16.23)
Do you have belief that your body should be kept intact after death?	
Yes	72 (17.18)
No	347 (82.82)
Do you have fear that your body will be disfigured, if you donate organs?	
Yes	55 (13.13)
No	364 (86.87)
Practice	
Have you pledged/signed to donate an organ?	
Yes	70 (16.71)
No	349 (83.29)
Have you ever donated an organ?	
Yes	10 (2.39)
No	409 (97.61)
Empathy	
High empathy	125 (29.8)
Low empathy	294 (70.2)

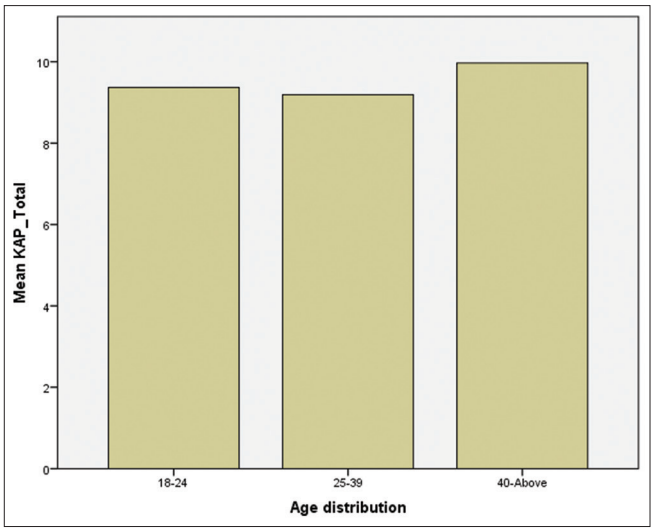

Figure S1: The relationship between knowledge-attitude-practice total and age