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Original Article

Characteristics of Clinicians Are Associated With Their Beliefs About ICD Deactivation: Insight From the DECIDE-HF Study

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ABSTRACT

Background: Discussing goals of care with heart failure patients is recommended but is not done systematically, due to factors such as time and personal beliefs. A recent survey showed that one-fifth of clinicians believe that implantable cardioverter defibrillator deactivation (ICDD) is unethical or constitutes physician-assisted suicide. We investigated whether individuals' characteristics are associated with these beliefs.

Methods: The Decision-Making About Goals of Care for Hospitalized Patients With Heart Failure (DECIDE-HF) survey was given to health-care providers at 9 hospitals to assess their perceived barriers to

RÉSUMÉ

Contexte : Une discussion sur les objectifs de soins avec les patients atteints d'insuffisance cardiaque est recommandée, mais elle n'est pas systématiquement menée en raison de facteurs tels que les contraintes de temps et les croyances personnelles. Selon une enquête récente, un cinquième des cliniciens croient qu'une désactivation d'un défibrillateur cardioverteur implantable (DDCI) est contraire à l'éthique ou représente un suicide assisté par le médecin. Nous avons vérifié si des caractéristiques individuelles sont associées à ces croyances.

Méthodologie : L'enquête DECIDE-HF (*Decision-Making About Goals of Care for Hospitalized Patients With Heart Failure*) a été réalisée chez

Advances in pharmacologic and device therapies, such as use of implantable cardioverter defibrillators (ICDs), have dramatically improved survival in patients with heart failure (HF).[1] Given that ICDs are indicated for primary or secondary prevention of ventricular arrhythmia and/or sudden cardiac death,[2] their utility at end-of-life care is debatable. Inappropriate and even appropriate shock deliveries can cause pain, reduced quality of life,[3] and even prolonged suffering,[4] as the metabolic changes occurring at the very end of life increase susceptibility to receiving shocks deemed appropriate by the device.[5] Although most patients find the administration of shocks uncomfortable and distressing,[5,6] almost one-fourth of those with a do-not-resuscitate order have received ICD shocks in their last 24 hours of life.[7] Further, very few clinicians discuss the eventual possibility of ICD deactivation

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Ethics Statement: All local institutional review boards approved the protocol, and participants provided written consent. This study was conducted in compliance with the Canadian Privacy Legislation and the revised (2013) Declaration of Helsinki.

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goals-of-care discussions. The association between respondent characteristics and their beliefs was examined using 2 adjusted logistic regression models.

Results: We included 760 clinicians (459 nurses, 94 fellows, and 207 cardiologists). The responses varied among professions, with the belief that ICDD is unethical considered to be important barrier by nurses (24%), fellows (10%), and staff (7%); $P < 0.001$). After adjusting for site, spirituality being more important in life (odds ratio [OR]: 2.21; 95% confidence interval [CI]:1.37-3.56; $P = 0.001$, compared to less important), region of training (Asia [OR: 5.88; 95% CI: 2.12-16.31; $P = 0.001$] and Middle East [OR: 5.55; 95% CI:1.57-19.63; $P = 0.008$] compared to Canada), and years in practice (OR: 1.32; 95% CI: 1.07-1.63; $P = 0.01$ per decade) influenced beliefs about ICDD being unethical, with similar results for the belief that ICDD represents physician-assisted suicide.

Conclusions: Sociocultural factors, region of training, and profession influence clinicians' beliefs about ICDD being unethical and representing physician-assisted suicide. These factors and beliefs must be acknowledged when facing the delicate issue of end-of-life discussion.

des professionnels de la santé de neuf hôpitaux dans le but d'évaluer les obstacles qu'ils percevaient face à la discussion sur les objectifs de soins. Le lien entre les caractéristiques des répondants et leurs croyances a été analysé à l'aide de deux modèles ajustés de régression logistique.

Résultats : Nous avons interrogé 760 cliniciens (459 infirmières, 94 médecins associés et 207 cardiologues). Les réponses ont varié d'une profession à l'autre, la croyance qu'une DDCI est contraire à l'éthique étant considérée comme un obstacle important par 24 % des infirmières, 10 % des médecins associés et 7 % des membres du personnel ($p < 0,001$). Après ajustement selon l'établissement, l'importance de la spiritualité dans la vie (très important [rapport de cotes {RC}] = 2,21; intervalle de confiance [IC] à 95 % : 1,37-3,56; $p = 0,001$ comparativement à moins important), la région d'obtention du diplôme (Asie [RC = 5,88; IC à 95 % : 2,12-16,31; $p = 0,001$] et Moyen-Orient [RC = 5,55; IC à 95 % : 1,57-19,63; $p = 0,008$] comparativement au Canada) et le nombre d'années d'exercice (RC = 1,32; IC à 95 % : 1,07-1,63; $p = 0,01$ par tranche de 10 ans) ont influencé les croyances voulant qu'une DDCI soit contraire à l'éthique, et les résultats ont été similaires pour la croyance selon laquelle une DDCI représente un suicide assisté par le médecin.

Conclusions : Des facteurs socioculturels, la région de formation et la profession influencent les croyances des cliniciens sur la DDCI et le fait qu'ils la considèrent comme étant une démarche contraire à l'éthique ou un suicide assisté par un médecin. Ces facteurs et croyances doivent être reconnus lorsque vient le temps d'aborder la délicate question de la discussion sur la fin de vie.

(ICDD), either before implantation or at the time of battery replacement, and then when the time comes at end of life, less than half of terminally ill patients were given the option to turn it off,[8] with some having never even been informed of this possibility.[5]

Accordingly, routine implantation of ICDs raises the issue of possible deactivation once the goals of care have switched toward providing comfort. Several ethical analyses regarding ICDD have shown that it should not foster new moral issues.[9-12] Although withholding vs withdrawing therapies may appear to be equivalent ethically,[13] their psychological impacts may be viewed as different by some healthcare professionals and patients,[9,14] as shown in a qualitative patient focus group.[5] Patients viewed device deactivation as something special,[15] and this possibility was discussed with the professionals only very infrequently.[16]

A recent survey of healthcare professionals on what they perceive to be barriers to their engagement in end-of-life discussion with hospitalized HF patients showed that the most important perceived barriers were family member or patient difficulty accepting a poor prognosis, lack of understanding about the limitations and harms of life-sustaining treatments, and lack of agreement among family members about goals of care.[17] In addition, we found that one-fifth of the respondents considered ICDD to be unethical and/or to represent assisted suicide, while clinician characteristics explained only 3% of the variance overall.[17] Our aim here was to explore the individual characteristics of these clinicians, postulating that some might be associated with these beliefs about barriers to end-of-life discussion.

Methods

Decision-Making About Goals of Care for Hospitalized Patients With Heart Failure (DECIDE-HF) was a survey of healthcare providers (cardiology nurses, fellows, and staff) from 9 Canadian teaching hospitals conducted to identify barriers to goals-of-care conversations with hospitalized HF patients. It provided insight about clinician perspectives, as well as a ranking of the important barriers. The questionnaires were returned by 770 of 1024 (75.2%) of the eligible clinicians, and the results have been published previously.[17] We found that almost 20% of respondents viewed ICDD as being unethical (outcome 1) or as constituting physician-assisted suicide (outcome 2). The present analysis focuses on these 2 barriers. The specific questions examined by the survey related to this analysis can be found in Supplemental Appendix S1. Responses were graded using a Likert scale, with 1 being *extremely unimportant*, and 7 being *extremely important*. For the present analysis, we dichotomized a priori the outcomes as *important* (7—*extremely important*; 6—*very important*; or 5—*somewhat important*) vs *unimportant* (4—*neither important nor unimportant*; 3—*somewhat unimportant*; 2—*very unimportant*; and 1—*extremely unimportant*).[17]

The following variables were included in this analysis: age; sex; profession; experience; site; ethnicity; religious background; the importance of spirituality in the respondent's life; region of training. Two multivariate models were used to determine the independent association of these characteristics with each of the 2 outcomes.

Statistical analysis

Raw agreement and Kappa's chance corrected agreement between the 2 dichotomized outcomes were reported, and the proportion who responded *important* in each profession was reported for both outcomes. The distribution of respondent characteristics was compared between respondents who answered that the barriers were *important* vs *unimportant*. Categorical characteristics are reported as counts and percentages and compared using the χ^2 test. As some categories were

sparse, we verified the P values obtained by the χ^2 test by estimating exact P values using a Monte Carlo simulation based on 10,000 random simulations under the null hypothesis of no association. The Mantel−Haenszel test was used to stratify categorical characteristics by profession, and the stratified Wilcoxon rank sum (Van Elteren) test, weighted by the stratum size, was used for continuous characteristics.

For both outcomes, separate logistic regression models were tested. We first modelled each characteristic separately in a series of unadjusted single predictor models. For categorical variables with more than 2 categories, we estimated odds ratios (ORs) with 95% confidence intervals (CIs) for each category vs the referent category. P values for each category vs the referent were provided, as well as an overall P value for the given variable. We then used backwards, stepwise selection with an entry and retention criteria of $P < 0.15$ to select variables for inclusion in a multivariable model. The single predictor and the first model treated site as a fixed effect, but the multivariable modelling was repeated, treating site as a random effect as estimated by a generalized linear mixed-effects model with a logit link and binomial response distribution. SAS version 9.4 (SAS Institute Inc., Cary, NC) was used. No correction was used for multiplicity of tests, and no imputation was made for missing data.

All local institutional review boards approved the protocol, and participants provided written consent. This study was conducted in compliance with Canadian Privacy Legislation and the revised (2013) Declaration of Helsinki.

Results

From DECIDE-HF, 760 respondents answered the questions of interest and constitute our study population: 459 nurses, 94 fellows, and 207 staff cardiologists.

ICDD is unethical

The characteristics of the whole population and the subgroup of participants who felt that ICDD is unethical are shown in Table 1 and Figure 1. By univariate analysis, sex, ethnicity, profession, location of training, importance of spirituality, and site were statistically associated with this belief. We then constructed profession-specific analyses, and found that sex was no longer independently associated with ICDD being perceived as unethical, whereas having been in practice for fewer years became significant ($P = 0.023$).

Table 2 provides the results of logistic regression, with the dependent variable *ICDD is unethical* being an important barrier to discussing goals of care. By multivariate analysis, sites and region of training (Asia [OR 5.88, 95% CI 2.12-16.31, $P = 0.001$], Middle East [OR 5.55, 95% CI 1.57-19.63, $P = 0.008$] and other [OR 5.24, 95% CI 1.89-14.51, $P = 0.001$]) remained significant. In addition, profession was significant, with 24% of the nurses (OR = 5.04, 95% CI 2.17-11.71, $P < 0.001$) believing that ICDD is unethical, compared to 10% of the fellows and 7% of the cardiologists ($P < 0.001$), as was the importance of spirituality ($P < 0.004$). Participants reporting a Likert-scale rating of 5-7 for "importance of spirituality/religion" were twice as likely to consider ICDD unethical as were respondents reporting "less importance of spirituality/religion" (Likert-scale rating of 1-4; OR = 1.96, 95% CI 1.24-3.10). The generalized mixed-effects model showed similar results (data not shown).

ICDD represents physician-assisted suicide

Supplemental Tables S1 and S2 indicates that results for the belief that *ICDD represents physician-assisted suicide* were similar to those for the *ICDD is unethical* outcome. The correlation and agreement between the responses to the 2 barriers were very high (Spearman = 0.88, Kappa = 0.88; 95% CI 0.85-0.91).

Discussion

We showed that clinician characteristics are associated with their beliefs about ICDD being unethical or representing physician-assisted suicide. Awareness of these barriers is important, as they may create additional challenges in discussing goals of care with patients hospitalized with HF. We found that profession (nurse, fellow, or cardiologist), ethnicity, region of training, sites, and importance of spirituality were all significantly associated with these specific beliefs. These individual factors appeared to be more important than patient-related factors (age, sex, previous discussion, HF severity, comorbidities, number of admissions, number of shocks, treatment intent, and social support), which explained only 10% of the likelihood of and 1% of clinician confidence in discussing ICDD, in a previous report.[18]

Type of professionals

The effect of profession was striking, with nurses and fellows being respectively 5.04 and 2.23 times more likely to believe that ICDD is unethical, compared to staff. The finding that fellows tend to be more likely than staff to have this belief has been previously reported.[19] This belief might be explained by both the clinical skills of nurses and fellows and the concept of experiential learning in ethical dilemmas—those with prior ethics education are more comfortable discussing withholding of life-prolonging treatment, with fellows feeling more competent than medical students,[20] who consider themselves inadequately trained to engage in such discussions.[21] Finally, nurses and fellows may carry an idealistic view of ICDs, overestimating the expected benefit (ie, survival) and minimizing the inconveniences (ie, lead failure, inappropriate shocks), especially early in their career when they have not yet witnessed shock deliveries, with the attendant discomfort[3] and sometimes prolonged suffering.[4] On the other hand, nurses may be in a privileged position to discuss these issues, per their focus on symptom control, knowledge of palliative care, and close proximity to the patient.[18,22] Yet, they feel this discussion should be initiated by a physician, who they believe is a better judge of prognosis[17]; likewise, nurses in palliative oncology described themselves as being in a difficult position, trapped between the patient and the physician.[23] Furthermore, Kramer and colleagues reported the uncomfortable feelings of nurses regarding their involvement in ICDD discussion, and their impression of actively ending the patient's life instead of waiting for the so-called natural evolution of the disease.[24] As a consequence, specialist nurses are less involved in ICDD

Table 1. Participant characteristics by belief that implantable cardioverter defibrillator deactivation is unethical being an important barrier to end-of-life discussions

Characteristic	All n = 760	Important barrier n = 132	Not an important barrier n = 628
Age, y	n = 716	n = 124	n = 592
	40.4 ± 11.4	40.9 ± 11.9	40.4 ± 11.3
	(21.0−74.0)	23.0−74.0	(21.0−74.0)
Sex			
Missing	24 (3.2)	6 (4.5)	18 (2.9)
Male	273 (35.9)	26 (19.7)	247 (39.3)
Female	463 (60.9)	100 (75.8)	363 (57.8)
Profession			
Nurse	459 (60.4)	109 (82.6)	350 (55.7)
Fellow	94 (12.4)	9 (6.8)	85 (13.5)
Staff member	207 (27.2)	14 (10.6)	193 (30.7)
Ethnicity			
Missing	39 (5.1)	9 (6.8)	30 (4.8)
Other	15 (2.0)	2 (1.5)	13 (2.1)
White	518 (68.2)	76 (57.6)	442 (70.4)
South Asian	14 (1.8)	8 (6.1)	6 (1.0)
Chinese	36 (4.7)	2 (1.5)	34 (5.4)
Black	17 (2.2)	6 (4.5)	11 (1.8)
Filipino	30 (3.9)	15 (11.4)	15 (2.4)
Latin American	12 (1.6)	3 (2.3)	9 (1.4)
Arab	27 (3.6)	5 (3.8)	22 (3.5)
Southeast Asian	44 (5.8)	3 (2.3)	41 (6.5)
West Asian	2 (0.3)	1 (0.8)	1 (0.2)
Korean	6 (0.8)	2 (1.5)	4 (0.6)
Religion			
Missing	35 (4.6)	9 (6.8)	26 (4.1)
Other	39 (5.1)	9 (6.8)	30 (4.8)
Roman Catholic	257 (33.8)	52 (39.4)	205 (32.6)
Protestant Christian	89 (11.7)	17 (12.9)	72 (11.5)
Orthodox Christian	23 (3.0)	4 (3.0)	19 (3.0)
Other Christian	24 (3.2)	7 (5.3)	17 (2.7)
Muslim	39 (5.1)	7 (5.3)	32 (5.1)
Jewish	20 (2.6)	3 (2.3)	17 (2.7)
Buddhist	11 (1.4)	2 (1.5)	9 (1.4)
Hindu	12 (1.6)	1 (0.8)	11 (1.8)
Sikh	6 (0.8)	1 (0.8)	5 (0.8)
No affiliation	205 (27.0)	20 (15.2)	185 (29.5)
Location of training			
Missing	23 (3.0)	6 (4.5)	17 (2.7)
Other	7 (0.9)	5 (3.8)	2 (0.3)
Canada	623 (82.0)	95 (72.0)	528 (84.1)
United States	11 (1.4)	2 (1.5)	9 (1.4)
UK/Ireland/Australia/New Zealand	18 (2.4)	0 (0.0)	18 (2.9)
Europe	28 (3.7)	4 (3.0)	24 (3.8)
Asia	21 (2.8)	11 (8.3)	10 (1.6)
Middle East	15 (2.0)	5 (3.8)	10 (1.6)
Central or South America	8 (1.1)	1 (0.8)	7 (1.1)
Africa	6 (0.8)	3 (2.3)	3 (0.5)
Years of practice	n = 731	n = 125	n = 606
	14.5 ± 11.1	15.3 ± 12.3	14.3 ± 10.9
	(0.0−52.0)	(0.0−50.0)	(1.0−52.0)
Importance of spirituality	n = 736	n = 126	N = 610
	4.4 ± 1.8	4.9 ± 1.8	4.3 ± 1.8
	(1.0−7.0)	(1.0−7.0)	(1.0−7.0)
Site			
1	158 (20.8)	23 (17.4)	135 (21.5)
2	75 (9.9)	8 (6.1)	67 (10.7)
3	91 (12.0)	20 (15.2)	71 (11.3)
4	94 (12.4)	12 (9.1)	82 (13.1)
5	63 (8.3)	17 (12.9)	46 (7.3)
6	63 (8.3)	17 (12.9)	46 (7.3)
7	78 (10.3)	9 (6.8)	69 (11.0)
8	72 (9.5)	12 (9.1)	60 (9.6)
9	66 (8.7)	14 (10.6)	52 (8.3)

Values are reported as n (%) or mean ± standard deviation (min−max). The n reported for the continuous variables is lower than the n for the column, due to missing data.

Table 2. Logistic regression results for the belief implantable cardioverter defibrillator deactivation is unethical being an important barrier to end-of-life discussions, by individuals' characteristics

	N*	Unadjusted OR† (95% CI)	*P* value	Adjusted OR‡ (95% CI)	*P* value
Age (per decade)	716	1.04 (0.88-1.24)	0.625	Not selected at $P < 0.15$	
Sex (female vs male)	736	2.62 (1.65-4.15)	< 0.001	1.65 (0.85-3.21)	0.141
Ethnicity (vs white)	721		0.069	Not selected at $P < 0.15$	
Arab	27	1.32 (0.49-3.60)	0.585		
Asian	132	1.79 (1.12-2.86)	0.016		
Black	17	3.17 (1.14-8.83)	0.027		
Latin American	12	1.94 (0.51-7.32)	0.329		
Other	15	0.89 (0.20-4.04)	0.885		
White	518	Referent		Referent	
Occupation (vs staff)	760		< 0.001		0.001
Fellow	94	1.46 (0.61-3.50)	0.397	2.23 (0.75-6.64)	0.151
Nurse	459	4.29 (2.40-7.70)	< 0.001	5.04 (2.17-11.71)	< 0.001
Staff	207	Referent		Referent	
Region of training (vs Canada)	737		< 0.001		< 0.001
Asia	21	6.11 (2.53-14.79)	< 0.001	5.88 (2.12-16.31)	0.001
Middle East	15	2.78 (0.93-8.31)	0.068	5.55 (1.57-19.63)	0.008
Europe/Australia/New Zealand	46	0.53 (0.19-1.51)	0.234	0.48 (0.15-1.54)	0.217
United States	11	1.24 (0.26-5.81)	0.789	1.43 (0.27-7.53)	0.672
Other	21	4.17 (1.71-10.17)	0.002	5.24 (1.89-14.51)	0.001
Canada	623	Referent		Referent	
Years in practice (per decade)	731	1.09 (0.92-1.29)	0.345	1.32 (1.07-1.63)	0.010
Religious background (vs no affiliation)	725		0.005	Not selected at $P < 0.15$	
Christian	393	2.36 (1.40-3.99)	0.001		
Other	127	2.05 (1.07-3.90)	0.030		
No affiliation	205	Referent		Referent	
Importance of spirituality/religion in your life (very or extremely important vs less)	736	2.23 (1.50-3.31)	< 0.001	2.21 (1.37-3.56)	0.001
Site (vs 1)	760		0.042		0.003
2	75	0.70 (0.30-1.65)	0.426	1.07 (0.40-2.82)	0.895
3	91	1.65 (0.85-3.21)	0.138	3.35 (1.53-7.34)	0.003
4	94	0.86 (0.41-1.82)	0.691	1.06 (0.46-2.43)	0.896
5	63	2.17 (1.07-4.12)	0.033	3.54 (1.49-8.40)	0.004
6	63	2.17 (1.07-4.42)	0.033	3.41 (1.49-7.84)	0.004
7	78	0.77 (0.34-1.74)	0.525	0.96 (0.38-2.44)	0.936
8	72	1.17 (0.55-2.51)	0.680	1.07 (0.45-2.56)	0.882
9	66	1.58 (0.76-3.30)	0.224	1.57 (0.66-3.74)	0.306
1	158	Referent		Referent	

The Hosmer-Lemeshow test for age and years of practice from the single predictor models (ie, unadjusted) were both $P > 0.2$, justify modelling them as linear. The Hosmer-Lemeshow test for the selected multi-predictor model was $P = 0.094$.

CI, confidence interval; OR, odds ratio.

*Number of nonmissing values in the analysis.

†Each predictor was modelled separately without adjustment for other variables.

‡This model included predictors that were selected with $P < 0.15$ using backward stepwise selection. This model treated site as a fixed effect using regular multiple logistic regression. However, results were very similar when site was treated as a random effect using a generalized linear mixed-effects model.

discussion than they probably should be, at least partly because of the medical hierarchy.[18]

Region of training and ethnicity

Only a minority of professionals trained in North America and Europe had the beliefs that ICDD is unethical or represents physician-assisted suicide, which had a greater likelihood of occurring for those trained in Asia or the Middle East. Our results are similar to those of Hill and colleagues,[18] who showed that US healthcare professionals are more confident about their decisions, having fewer ethical and legal concerns regarding palliative care issues than their European counterparts,[18] despite similar national recommendations regarding ICDD.[25,26]

Likewise, ethnicity was associated with the belief that ICDD represents physician-assisted suicide, with professionals from Asian countries being more likely to have this belief. Ethnicity is a complex factor that encompasses not only region, but also religion, family issues, legislation, economic status, personal attitude, and consequently various beliefs on end-of-life care within a geographic area.[27] Phua and colleagues[27] tried to explain the attitudes about end-of-life care held in Asian societies, wherein there is no unified approach, given the differences in societal culture among such countries. Nevertheless, he showed that a majority of Asian healthcare providers (74.5%) perceived ethical differences between withholding (not offering a treatment) and withdrawing (removing a device or a support) therapies in terminally ill patients and therefore were more likely to be aggressive in application of organ-supporting care at the end of life, in comparison to their American and European colleagues.[27] Understanding the ethnic background of each member of the multidisciplinary team may be helpful to

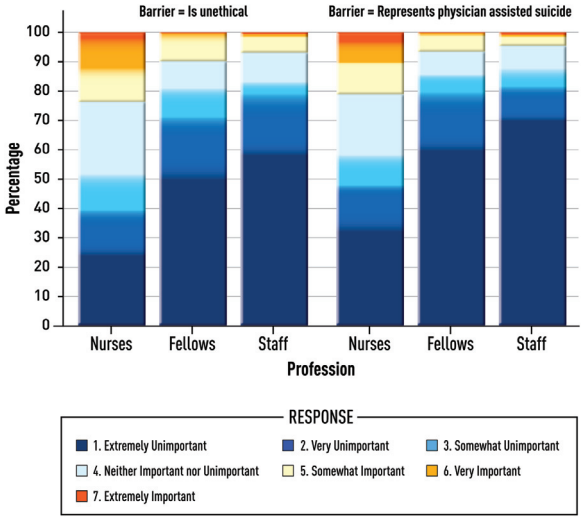

Figure 1. Beliefs about implantable cardioverter defibrillator deactivation (ICDD), by profession. Distribution of the responses to "ICDD is unethical" (**left**) and "ICDD represents physician-assisted suicide" (**right**), by profession. The response distributions of both barriers were significantly different between professions (both $P < 0.001$).

locally implement end-of-life care programs that respect individual beliefs.

Religion and importance of spirituality in life

Although we found no association with a specific religious affiliation, spirituality was an important variable. Respondents with a high level of spirituality had twice the likelihood of having the belief that ICDD was unethical. This suggests that the place of spirituality in healthcare professionals' lives may influence their medical decisions.[28] In contrast, Voorheesa showed that professionals with important religious convictions or spirituality were more likely to discuss prognosis with terminally ill cancer patients because of their values and the importance given to communication.[29] One potential explanation of this apparent discrepancy might lie in the unpredictable trajectory of HF patients, compared to those in oncology, who have periods of stability followed by deterioration and uncertainty about prognosis.[30] Nevertheless, this trajectory should remind us that a hospital admission for acute HF decompensation or even for ICD shocks, whether appropriate or inappropriate, is a marker of worse prognosis.[31,32] This vulnerable phase could be an opportunity to reexamine the patient's goals for care and advance directives, including discussion about ICDD. Preliminary discussion should ideally occur before implantation and at the time of consideration for battery replacement.[33] This discussion might be particularly important for a family with cultural and religious reasons for declining ICDD, as they may believe that ICDD accelerates death.[33]

The ethics of ICDD

Almost one-fifth of our respondents were apprehensive regarding the ethics of ICDD. Although we cannot determine whether these beliefs actually impede their delivery of care, it seems important to reconcile healthcare providers' personal perceived barriers to discussion and their obligation to advanced HF patients to provide fair evidence for informed consent regarding ICDD.[15,28] An educational program clarifying the ethical and/or legal aspects of ICDD might be of value—one that considers the intention behind the intervention, which is to avoid a futile and potentially harmful treatment by ICD, by letting the patient die from the terminal disease itself; by contrast, euthanasia results directly in the patient's death.[28] Also, distinguishing between the types of treatment might be helpful. Although a patient can request that any treatment be stopped at any time (such as ICD or ventilator support, which are outside the individual's body and can easily be turned off),[9,15] they cannot ask to have undone what has become an integral part of their bodies (eg, a cardiac transplant).[15] These subtleties could be integrated into continuous professional development programs, to create a collaborative effort within the multidisciplinary team to engage in end-of-life discussions with advanced HF patients.[18] A short standardized educational program has recently shown benefits, increasing both the rate of ICDD discussion and ICDD.[34] Future research needs to examine optimal training methods in patient-centred communication, with a focus on addressing the barriers identified by both patients and clinicians. Also important for future research is to consider clinicians' training pathways and cultural differences when designing and implementing training in providing patient-centred care and prognosis.[35]

Limitations

We included healthcare professionals from academic centres with onsite electrophysiology services; thus, our results might not be generalizable to community hospitals, where arrhythmic storms and complex arrhythmias might be less frequent. Differences among professionals may be greater in community hospitals, owing to lower levels of exposure and knowledge about ICDD. Furthermore, only specific characteristics were studied; consequently, we cannot exclude the possibility that other factors may influence professionals' beliefs. In addition, our sample size was relatively small for some subgroups, and despite having an excellent correlation among respondents for 2 barriers, some results did not reach statistical significance.

Conclusion

Decision-making regarding ICDD is complex and requires a multidisciplinary approach that respects differences in the baseline perceptions of clinicians. We found that the characteristics of healthcare professionals that are associated with the beliefs that ICDD is unethical or represents physician-assisted suicide include profession, location of training, ethnicity, and the importance of spirituality in their life, with nurses and fellows being more likely to have these as barriers to discussion with patients, compared to staff physicians. These variations in beliefs suggest that further discussion is warranted, taking into consideration sociocultural issues and interprofessional differences. Knowledge of these ethical issues should be integrated, or reinforced, in the respective academic paths of medical trainees, fellows, and nurses, and regularly discussed in continued medical education meetings; these

should include not only explanations about ICD's indication and function, but also information regarding legal and ethical issues on ICD implantation and deactivation. Finally, it is essential to acknowledge that personal characteristics do influence thoughts about ICDD, so that cardiology healthcare workers can stay attentive to their own beliefs and consider first and foremost the well-being of the patient.

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Supplementary Material

To access the supplementary material accompanying this article, visit *CJC Open* at https://www.cjcopen.ca/ and at doi:10.1016/j.cjco.2021.03.006.