

# BMJ Open Determinants of treatment decisions in advanced dementia: a protocol for a cross-cultural mixed-methods study

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## ABSTRACT

**Introduction** Values and preferences are key determinants of optimal care, and variability in patient values and preferences often dictates differences in patient management. Clinicians' views of patients' values and preferences may differ across cultural aspects and stage of training, but the extent to which this is the case remains uncertain. One key value and preference issue is the trade-off between quantity and quality of life, and this issue is particularly prominent among patients with dementia. We therefore propose to investigate the extent to which physicians' perceptions of optimal management for patients living with advanced dementia may differ due to cross-cultural factors and stage of medical training.

**Methods and analysis** We will conduct a sequential explanatory mixed-methods study (QUAN → qual). First, we will administer paper-based or electronic surveys during educational sessions, conferences and rounds to medical students, residents and physicians in ten countries, either in person or online. Following that, a qualitative inquiry, guided by the findings of the quantitative study and the principles of the interpretive description design, will inform an in-depth exploration of the predictive factors identified in the quantitative data analysis.

**Ethics and dissemination** The Hamilton Integrated Research Ethics Board at McMaster University has approved this study (approval number 2024-17651). We will disseminate our findings in peer-reviewed publications and present results at conferences as oral and poster presentations.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Integration of quantitative and qualitative approaches will clarify and provide a deeper understanding of those decisions.
- ⇒ Multicultural perspective of the treatment of patients with advanced dementia in several countries in different continents.
- ⇒ Clinicians' perspectives on the clinical management of patients with advanced dementia may not reflect the values and preferences of patients and their families.

and preference-sensitive decision, shared decision-making.

A general situation in which values and preferences are salient is the trade-off between quality and quantity of life. One clinical context in which patients, families and clinicians face this trade-off is advanced dementia. Dementia is a progressive, life-limiting illness with no curative treatment. It affects over 55 million people worldwide,<sup>2</sup> and this number will increase to 78 million in 2030 and 152 million by 2050.<sup>3</sup>

This condition represents a burden not only on patients but also to families and caregivers. Patients living with dementia often become completely dependent and unable to make decisions about their own healthcare for many years before dying. During those years, decision-making becomes challenging, especially when life-threatening conditions affect these patients.<sup>4–10</sup> Pneumonia, for example, is a frequent cause of death in patients with dementia.

Although guidance exists for physicians dealing with patients with advanced dementia, those studies usually focus on shared decision-making with relatives and

## INTRODUCTION

### Background

The third principle of Evidence-Based Medicine states that clinical decision-making must take into account patients' values and preferences.<sup>1</sup> Values and preferences will inevitably vary between individuals. This variability requires, to achieve optimal decisions for each individual considering a value



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caregivers.<sup>11–13</sup> A survey reported that, for most patients (90%) with advanced dementia, clinicians are unaware of patients' values and preferences related to end-of-life care.<sup>14</sup> If family members are not available, clinicians must make decisions about intensity of care on behalf of patients, and knowledge of typical patient values and preferences may guide that decision. Guideline panels, when making recommendations, must always use typical or average values and preferences.<sup>15 16</sup> Thus, typical values and preferences are highly relevant for both individual decision-making and clinical practice guidelines.

Values and preferences may differ from person to person, but also systematically between jurisdictions. For instance, medicine in the USA tends to be more aggressive than in Europe in the use of expensive treatments, sometimes without large net benefit.<sup>17</sup> Religion, culture and local traditions may also play large roles in variation in values and preferences.<sup>18 19</sup>

We have conducted informal surveys with clinicians and medical students attending educational rounds and seminars in which we presented a scenario of an individual with advanced dementia with a very poor quality of life who contracts pneumonia. These informal surveys have generated findings that appear striking and have generated hypotheses—among experienced clinicians, secular North American audiences overwhelmingly suggest that such a patient should not be treated with antibiotics, as do clinicians in Thailand's Buddhist culture. Those in a Catholic culture have proved considerably more inclined to treat with antibiotics, and those in Islamic cultures even more inclined to treat. We also observed within cultures that medical students with minimal clinical experience are more inclined to treat than are their experienced seniors. In all cultures, there is some disagreement among respondents, and in Catholic cultures and among students in secular and Buddhist settings, the disagreement is considerable.

If a systematic study were to confirm these findings, it would provide insights into the impact of culture, religion and stage of medical training on the determinants of clinician and future clinician attitudes toward the trade-off between quality and quantity of life. These insights would be relevant to physician training in shared decision-making, to goal-setting in the care of patients with dementia and to guideline panels addressing issues in such care. We therefore plan to conduct a multinational survey addressing this question. Findings inconsistent with the results of these informal surveys would also be important and informative.

## RESEARCH OBJECTIVES

We aim to assess the relationship between stage of training and cross-cultural aspects with physicians' attitudes in the management of patients with advanced dementia. To achieve our objective, we will conduct a sequential explanatory mixed-methods study with medical students, residents and fully trained physicians from several countries

to investigate their approach to patients with advanced dementia.

## Methods and Analysis

Reporting of this study protocol and publication of our findings adhere to the Good Reporting of A Mixed Methods Study guidelines<sup>20</sup> and Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.<sup>21</sup>

The rationale for choosing a sequential explanatory mixed-methods study (QUAN → qual)<sup>22</sup> is that findings from quantitative data can complement and guide qualitative data collection.<sup>23</sup> Qualitative data can refine or add nuance to the understanding from quantitative data. Although we have hypotheses about why and how physician decision-making may vary across cultures and stages of medical training, robust quantitative data from a cross-sectional survey will allow optimal planning for a qualitative study that will explore, in depth, reasons for participants' choices.

The proposed study period is June 2025 to December 2026. First, we will administer paper-based or electronic surveys, either in person or online, during educational sessions, conferences and rounds to medical students, residents and physicians in ten countries. Subsequently, we will conduct a qualitative study guided by findings from the quantitative study and the principles of the interpretive description design and thematic analysis.<sup>24 25</sup> Finally, we will integrate findings from both qualitative and quantitative data. Three research questions will guide this mixed-methods study.<sup>22</sup>

### Quantitative research question

- Quantitative research question:  
Among medical students, residents and physicians, does decision-making for acute life-threatening medical conditions in patients with advanced dementia without capacity and substitute decision-makers differ according to medical training stage, country, age, religion, religiosity and presence of medical assistance in dying (MAiD) legislation?
- Qualitative research question:  
What are the different ways in which medical students, residents and physicians decide on the optimal aggressiveness of care for elderly patients living with advanced dementia? What experiences and beliefs underlie their decisions?
- Mixed-methods research question:  
How do the quantitative and qualitative findings improve our understanding of the factors and reasoning of medical students, residents and physicians' decision-making in acute life-threatening medical conditions in patients with advanced dementia without capacity and substitute decision-makers?

In the context of this study, we define capacity as a functional assessment performed by a physician to determine whether a patient can understand, make their own decisions and take responsibility for those decisions.<sup>26</sup> We

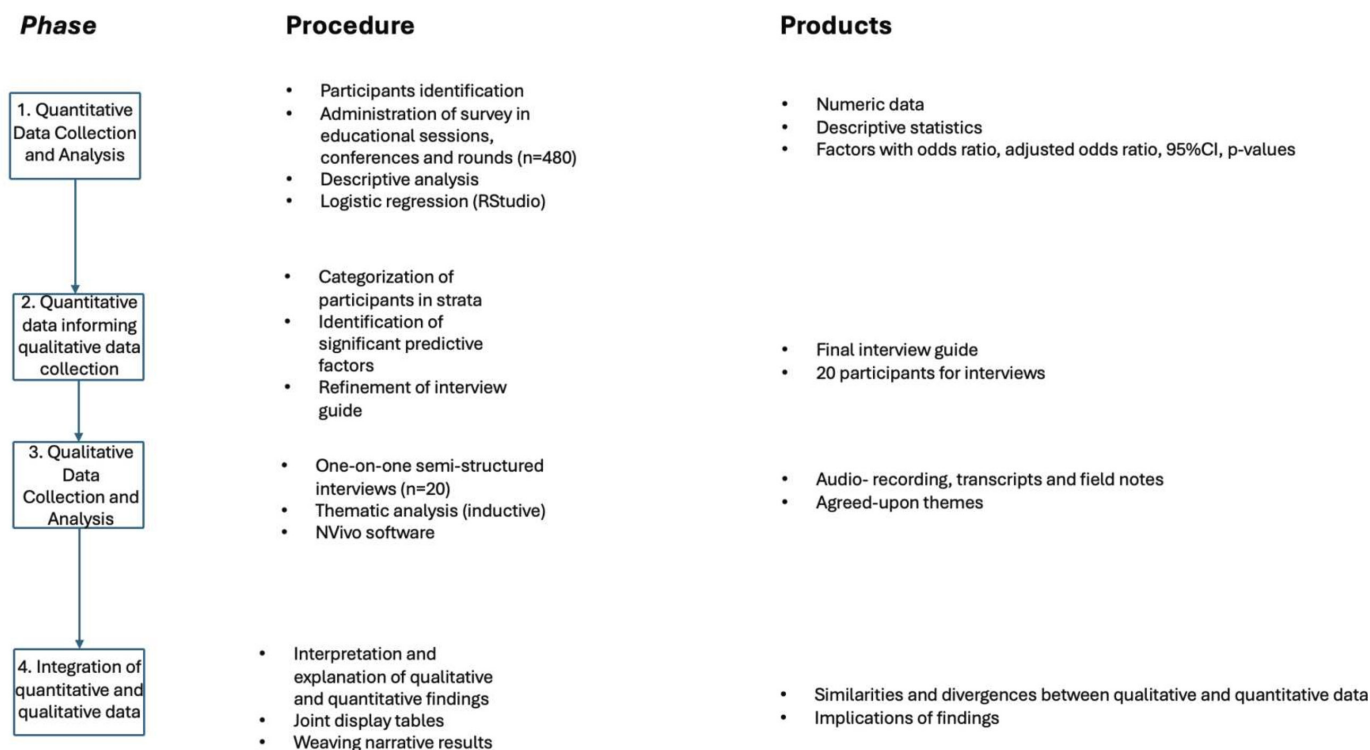


**Figure 1** Study flow diagram. Overview of the sequential explanatory mixed-methods study design (QUAN → qual). Quantitative findings will inform purposeful sampling and guide the subsequent qualitative phase, followed by integration of results from both strands.

define a substitute decision-maker as the person authorised to make decisions on behalf of a patient who is unable to make decisions about their personal care (figure 1).<sup>27</sup>

## Quantitative strand

### Study design, setting and participants

During educational sessions, conferences and rounds, we will administer paper-based or electronic surveys (REDCap v14.1.2) to medical students, residents and physicians in ten countries (Brazil, Cameroon, Canada, China, India, Norway, Saudi Arabia, Switzerland, Spain and the UAE). We will specifically target medical students, as well as primary care, internal medicine and intensive care trainees and physicians. We will focus on these ten countries to reflect a broad range of cultures and religious practices. Our strategy also enhances representativeness by recruiting across multiple training levels and clinical disciplines. This approach maximises variation in perspectives and minimises the risk that findings reflect a single institutional or cultural context.

To ensure optimal understanding of the questionnaire, the study team will assess and, if necessary, develop surveys in each language. If the educational session, conference or round is conducted in English without a simultaneous translation system, we will assume that the audience is proficient in English and administer the questionnaire in English.

To be eligible to participate, individuals need to be competent in one of the prespecified languages and attend, in person or online, the educational sessions,

conferences or rounds at one of the participating centres. Physicians and residents who participate in those sessions but are not from one of the specialties previously mentioned will not be eligible. Participation in this survey will be voluntary and acceptance to participate will be deemed informed consent.

At each site, we will recruit a physician from our professional or academic network to lead site-specific study procedures. These collaborators or their designated colleagues will give or secure permission for the administration of our questionnaire, introduce the exercise to participants and answer any questions from participants. At each session, we will present the audience with three different options to access our survey: website link, QR code or paper. Participants will have 10 min to provide their answers.

### Questionnaire and variables

The questionnaire will present a clinical scenario of an elderly patient living in a nursing home with advanced, debilitating dementia who moans in apparent discomfort for much of the day and is diagnosed with pneumonia. Participants will then choose between one of the two options as the most appropriate conduct: (A) this patient should receive antibiotics or (B) this patient should *not* receive antibiotics, followed by a question about their level of confidence in their response on a four-point Likert scale from 'Very confident' to 'Not at all confident' (Online supplemental appendix 1).

We will collect data on the following characteristics of study participants: country, age, sex, gender, religion, religiosity, professional status (medical student, resident or fully trained physician) and specialty (Online supplemental appendix 4).

We will capture only one of the three domains (organisational religious activity, non-organisational religious activity and intrinsic religiosity) captured in the five-item Duke Religion Index (DUREL).<sup>28</sup> Intrinsic religiosity will be the domain assessed and respondents will have a score from 3 to 15. Higher scores represent a more intense intrinsic religiosity. A full description of all the variables is outlined below:

1. The answer to the question “In your opinion, what is the most appropriate management?” is the primary outcome. This is a binary outcome (“This patient should receive antibiotics” or “This patient should not receive antibiotics”).
2. Age will be analysed, in years, as a continuous variable.
3. Religiosity: intrinsic religiosity will be analysed as a continuous variable. Based on their answers to questions “In my life, I experience the presence of the Divine (ie, God)”, “My religious beliefs are what really lie behind my whole approach to life” and “I try hard to carry my religion over into all other dealings in life” in a four-point Likert scale from ‘Definitely true’ to ‘Definitely not true of me’. Respondents will have a score ranging from 3 to 15.
4. Religion: ‘Catholic’, ‘Protestant’, ‘Evangelical’, ‘Hindu’, ‘Buddhist’, ‘Taoist’, ‘Islamic’, ‘Jewish’, ‘Sikhism’, ‘No religion’ and ‘Other’.
5. Stage of medical training: ‘Medical student’, ‘Resident’, ‘Attending/clinical fellow’.
6. Countries: Brazil, Cameroon, Canada, China, India, Norway, Saudi Arabia, Switzerland, Spain and UAE.
7. The level of confidence will be analysed as a continuous variable. The options will be coded from 1 to 4, from ‘Not at all confident’ to ‘Very confident’.
8. The presence or absence of MAiD legislation will be treated as a binary variable. This variable will represent whether MAiD is legal in the country where the physicians practise (Yes/No).

To ensure accurate translation, we will develop the questionnaire in English and, if necessary, with the assistance of professional translators, translate it into Portuguese, Mandarin, Spanish, Hindi, German, Norwegian, French and Arabic. Based on the average English proficiency of the audience, the research team will assess beforehand whether a translation of the survey will be necessary. To address the validity of the questionnaire, participants will respond to the following question with one of two response options: ‘Should we always prioritize prolonging life, even when quality of life is very poor?’ ‘(A) Yes’ or ‘(B) No’.

To ensure quality, understanding and validity, we will pilot test the questionnaire with five colleagues similar to our prospective respondents (two fully trained physicians, one resident and two medical students) in each of the

three countries, Canada, India and Brazil. During pilot testing, respondents will provide comments regarding the understanding, flow, salience, acceptability and administrative ease of the questionnaire. Reviewers will also look for any question that is poorly formulated or uses ambiguous terms. If concerns regarding understanding or clarity arise, we will modify the questionnaire accordingly. If the questionnaire requires any further changes after its administration in those three initial countries, we will, after modification, conduct additional testing in these three sites.

### Statistical analysis

We will perform a descriptive analysis presenting respondents’ baseline characteristics and responses with categorical data presented as counts (%) and continuous data presented as mean (SD) or median (quartile 1; quartile 3). Normality will be evaluated using the Shapiro-Wilk test and visual inspection of histograms and Q-Q plots, which will guide our choice of parametric or non-parametric statistical descriptors.

We will first explore associations in a univariate analysis using the Chi-square test and unpaired t-test, or their non-parametric equivalents when appropriate (eg, Mann-Whitney U test). To determine the factors associated with prescribing antibiotics, we will subsequently build a logistic regression model. The dependent variable will be whether the clinician would prescribe antibiotics in the scenario presented (yes/no). The independent variables will be age (years), religion (Catholic, Protestant, Evangelical, Hindu, Buddhist, Taoist, Islamic, Jewish, No religion and Other), religiosity (measured as a score), stage of medical training, country (Brazil, Cameroon, Canada, China, India, Norway, Saudi Arabia, Spain, Switzerland and UAE), level of confidence in the response (measured on a four-point Likert scale) and presence/absence of a MAiD legislation in the country where the physicians practise. Variables will be entered into the model as a block, resulting in four models:

- Model 1: unadjusted (univariate analysis).
- Model 2: adjusted for demographics (ie, age, gender).
- Model 3: + clinical variables (ie, stage of training).
- Model 4: + cultural/contextual predictors (ie, country, religion, religiosity, presence/absence of MAiD).

We will test the assumptions of (i) multicollinearity by examining variance inflation factors (VIFs) for all independent variables, using a  $VIF \geq 5$  as an indicator of potentially problematic collinearity and (ii) linearity through Box-Tidwell test and visually inspect scatterplots of the logit-transformed outcome versus each continuous predictor. Goodness of fit will be assessed using the adjusted  $R^2$  with model comparison facilitated using Akaike information criteria. To address potential clustering by country, we will use cluster-robust standard errors.

We will conduct a sensitivity analysis assuming a more in-depth nested data structure in which individuals are nested with their level of training, which is nested within

countries. We will then calculate the impact on the clinical scenario responses through a multivariable hierarchical model with stage of medical training as fixed effects and country as a random effect, adjusting for age, religion, religiosity, stage of medical training, level of confidence in the response and presence/absence of a MAiD legislation treated in the same way as in our primary analysis.

To prevent missing data, all items in the electronic survey must be completed prior to submission. As a result, we do not anticipate significant missing responses and will not perform any imputation procedures.

We hypothesise that more experienced clinicians and residents will be less inclined to prescribe antibiotics than medical students. We also hypothesise that clinical practice in Islamic countries will be more inclined to prescribe antibiotics than other countries, and respondents with a higher religiosity will be associated with a preference to prescribe antibiotics. We will measure the association between the validity question and the dependent variable using OR after survey administration is concluded in the three sites included in the pilot testing. The questionnaire will be considered valid if the association between the survey's main question and the validity question shows an  $OR \geq 1.7$ . This cut-off point, in the context of epidemiological research, corresponds to a moderate association.<sup>29</sup> If the criteria are not met in our initial sample (included in the pilot test), we will stop survey administration and revisit the survey construct.

We will present results as OR with corresponding 95% CIs and set a p value of 0.05 as the threshold for statistical significance. We will use RStudio statistical software to perform statistical analysis.<sup>30</sup>

### Sample size

Our sample size estimation is based on two approaches. First, we used a rule of thumb based on the number of independent variables and the number of events required for each degree of freedom. With this approach, we will require 20 events per factor.<sup>31</sup> The logistic regression model will include up to seven independent variables accounting for a total of 24 factors. For example, age (as

a continuous variable) counts as one factor, while stage of medical training counts as two factors since this is a mutually exclusive variable with three categories. We would then require a total of 480 participants to examine these factors in a multivariable analysis. The variables included in the model will be age, sex, religiosity, religion, stage of medical training, country, level of confidence in the response and MAiD legislation.

Our second approach involved a sample size estimation for a binary logistic regression. For an OR as small as 1.9, we will need 511 participants and for an OR as large as 2.5, we will need 240 participants at a level of significance  $\alpha=0.05$  and power  $(1-\beta)=80\%$ , assuming a binomial distribution and a multiple correlation of  $R^2=0.2$ . Online supplemental appendix 3 presents a graph of OR by sample size. This computation was performed using G\*Power 3.1.9.6.<sup>32</sup> Given the results of both approaches, we will target to recruit at least 511 participants.

### Quantitative data informing qualitative data collection

Based on the results of our survey, we will explore statistically significant predictive factors associated with the decision to prescribe (or not) antibiotics.<sup>22</sup> A categorisation matrix<sup>33</sup> will then guide the selection of our purposeful sample. Participants will be categorised into four main strata (figure 2). Participants will be divided into those four categories based on their medical training stage (medical students and residents vs fully trained physicians) and their decision to prescribe antibiotics (yes vs no). In this step, we will also refine our interview guide (online supplemental appendix 2) based on the findings from the quantitative phase.

### Qualitative strand

#### Study design

Interpretive description design will guide the qualitative paradigm of this mixed-methods study. This qualitative research design is ideal for this study because of the following: (1) it incorporates the disciplinary lens of the researchers involved in this study<sup>34</sup>; (2) allows flexibility and a combination of different approaches to sampling,

|                          |     | Stage of medical training    |                               |
|--------------------------|-----|------------------------------|-------------------------------|
|                          |     | Medical students & Residents | Attendings & Clinical fellows |
| Antibiotics prescription | Yes | n=                           | n=                            |
|                          | No  | n=                           | n=                            |

**Figure 2** Categorisation matrix guiding qualitative sampling. Matrix illustrating the four participant strata used for purposeful sampling in the qualitative phase.

data collection and analysis without compromising rigour/trustworthiness and (3) produces knowledge that is immediately applicable to real-world clinical practice.<sup>34</sup>

### Sampling and recruitment

This study will use purposeful sampling, meaning we will intentionally select participants who can provide the most relevant, rich and informative data. Participants who wish to be part of an interview to further clarify their responses will have the option to provide their names and email addresses at the end of the survey. Participants will be placed in one of the four strata previously mentioned (figure 2). We will also ensure that there is balance among the 10 participating centres. To be eligible to participate in this phase of the study, participants must have completed the survey and be proficient in English.

The aim of the study is narrow and we expect to conduct meaningful, in-depth interviews with each participant. However, we also acknowledge the four participant strata (cross-case) and the unknown number of predictive factors. We therefore estimated a sample size of 20 participants. We will include five participants from each strata. Nonetheless, interpretive description offers flexibility in different aspects of a qualitative study, including sampling.<sup>35</sup> Therefore, theoretical sampling—happening concurrently with data collection and analysis—may suggest the need to explore new themes, which can increase our initially estimated sample size.<sup>36</sup>

### Data collection

Thorne and colleagues argue that researchers must possess clinical expertise in order to maintain a disciplinary perspective when investigating a specific phenomenon.<sup>37</sup> JPL will therefore be responsible for conducting the interviews and will also be involved in data analysis. Data will be collected during single, one-on-one, semi-structured, in-depth, pilot-tested interviews that will happen either in person at a mutually agreed-upon location or virtually through a videoconference. A single interviewer will conduct all interviews to maintain consistency during data collection. Pilot testing of the interview guide (online supplemental appendix 2) with two clinician-researchers will help inform the length of the interviews and the appropriateness and flow of the questions. We aim to keep the interview duration between 30 and 40 min, ensure that questions elicit detailed responses and capture the main themes emerging from the quantitative part of this study. Before the beginning of each interview, the interviewer will confirm consent and review the research question and purpose of the study with the participant. Interviews will be audio-recorded and automatically transcribed verbatim using <https://otter.ai/>, a transcription software that utilises artificial intelligence and machine learning to convert speech into text. All transcripts will be human-verified (JPL) for accuracy and completeness. The interviewer will take field notes during interviews to capture tones, gestures, emotions and ideas not captured in the final transcription.

### Data analysis

The qualitative data will be analysed using thematic analysis.<sup>25 38</sup> This type of analysis encourages a systematic search for common themes and patterns within the data.<sup>39</sup> Considering the exploratory nature of this study and following the principles of interpretive description,<sup>37</sup> we will adopt an inductive approach with no predetermined coding scheme. After each interview, an analytic memo will be developed, which will help organise the following interview.

A constant comparative analytic approach—where data collection and analysis happen concurrently—will allow us to find similarities within and differences across the four strata. Emerging themes and codes will be challenged using a diagramming/mapping process during the initial phases of the analysis.<sup>40</sup> Given the infinite variety of experiences among physicians managing advanced dementia, we acknowledge that data saturation is not attainable in this study.<sup>41</sup> Instead, we will prioritise the depth and richness of our interviews and data interpretation.<sup>42</sup> The primary purpose of this analysis is to describe and understand the main factors influencing the decision-making process of the average physicians and soon-to-be physicians while acknowledging that extremes exist.

To enhance the credibility of our findings, two investigators will independently review transcripts, field notes and audio recordings. The two investigators will reach a consensus on a final codebook and all the authors will agree on a final list of themes. Investigators will meet after every five interviews. We will incorporate reflexive practices throughout the analytic process by documenting our assumptions, positionality and decision-making, consistent with guidance for reducing bias in reflexive thematic analysis.<sup>43 44</sup> Data will be stored and analysed using NVivo 12 Pro qualitative data analysis software.<sup>45</sup>

### Patient and public involvement

No patients were involved in formulating the research question or developing plans for the design, analysis, interpretation, reporting or implementation of this protocol.

### Integration of quantitative and qualitative findings

To integrate quantitative and qualitative findings, we will develop joint display tables.<sup>22 46</sup> Each theme will represent a row; one column will present logistic regression results, and another column will show quotes representing the agreed-upon themes. For example, if religiosity is considered a significant predictive factor in the survey, we will present its OR and a quote that represents the relationship between religiosity and the decision-making process to treat patients with advanced dementia. We will also use a weaving narrative approach to present findings from both paradigms, including similarities and divergences.<sup>22 46</sup> As such, we will ensure that qualitative data is also reflected in the qualitative findings. Before reporting any divergence between quantitative and qualitative data, we will verify the rigour of the methods used in each paradigm.<sup>47</sup>

**Table 1** Mitigation strategies to promote rigour

| Step                    | Criteria                          | Mitigation strategy                                                                                                                        |
|-------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Quantitative component  | Credibility                       | Pilot-testing of survey with clinician researchers                                                                                         |
|                         | Dependability and transferability | Training for standardisation of procedures across all sites                                                                                |
|                         | Credibility and confirmability    | Principal investigator will maintain a reflexive journal                                                                                   |
|                         | Credibility and confirmability    | Prespecified protocol and statistical plan published and available in peer-reviewed journal                                                |
|                         | Confirmability                    | The principal investigator will maintain an audit trail reporting all study decisions made throughout the study, including justifications  |
| Qualitative component   | Dependability                     | Interview guide used to standardise interview process                                                                                      |
|                         | Credibility                       | Refinement and pilot-testing of interview guide                                                                                            |
|                         | Credibility                       | Two investigators will independently review transcripts and then contrast themes                                                           |
|                         | Credibility                       | Core team will meet after every five interviews                                                                                            |
|                         | Credibility                       | Diagramming/mapping process to challenge emerging themes                                                                                   |
|                         | Confirmability                    | Principal investigator will maintain a reflexive journal                                                                                   |
|                         | Confirmability                    | The principal investigator will maintain an audit trail reporting all study decisions made throughout the study, including justifications. |
| Mixed-methods component | Credibility                       | Rationale for the use of mixed methods design is described in the protocol                                                                 |
|                         | Credibility                       | Study flow diagram presents all the steps, procedures and products of each stage                                                           |
|                         | Confirmability and dependability  | Triangulation of data sources (qualitative and quantitative)                                                                               |
|                         | Credibility                       | Investigation of convergences and divergences between qualitative and quantitative data                                                    |
|                         | Credibility                       | Conclusion drawn from both components will be incorporated into meta-inferences                                                            |
|                         | Confirmability                    | The principal investigator will maintain an audit trail reporting all study decisions made throughout the study, including justifications  |

We will then generate meta-inferences by integrating results across both strands; examining areas of convergence, divergence and complementarity to produce overarching conclusions that reflect the combined insights of the quantitative and qualitative data.

<sup>48 49</sup>

### Methodological rigor

As in any multicentre study, standardisation of the procedures is one of the main concerns to maintain consistency in data collection across all participating sites. To ensure consistency, we will hold a training meeting with the research personnel at each site before data collection. If translation is necessary, professional translation agencies will translate the surveys. Surveys and interview guides will be pilot tested with clinician researchers.

Strategies to promote the rigour/trustworthiness<sup>50</sup> of this qualitative research are categorised according to the Four-Dimensions Criteria developed by Lincoln and Guba.<sup>51</sup> These criteria include an assessment of the

study's credibility, dependability, confirmability and transferability. For this study, we present in [table 1](#) strategies used to improve the rigour of the qualitative, quantitative and mixed-methods components.

### Ethics and dissemination

The Hamilton Integrated Research Ethics Board at McMaster University has approved this study (approval number 2024-17651). Before initiating data collection, we will obtain local approval from the ethics review boards at each study centre. Participation in this study will be voluntary, and acceptance to participate in the survey (quantitative) will be deemed informed consent. However, written informed consent will be collected from each participant before each interview (qualitative).

We recognise that the clinical scenario addresses a sensitive topic and we will have a distress protocol to immediately halt the interview if a participant experiences emotional discomfort. Participants will be able to interrupt the interview and withdraw their consent at any

time. Only the research team will have access to identifiable data (name and email address). The research team will de-identify all interview transcriptions and field notes before storing them in the data analysis software. Participants can withdraw from the study at any time and request that their data be removed. Audio recordings, transcripts and field notes data will be stored securely on a password-protected server. Data will be destroyed after 10 years.

We will disseminate our findings in three peer-reviewed publications: protocol, quantitative results and mixed methods study. We will present those results in conferences as oral and poster presentations and to the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) community. We will also share findings with interviewed participants.

## DISCUSSION

This study was designed to examine the determinants of clinicians' decision-making in value-sensitive clinical scenarios involving advanced dementia. By using a case vignette and comparing responses across stages of medical training and cultural contexts, our protocol aims to disentangle how professional experience and sociocultural factors shape judgments about treatment aggressiveness when patients lack decisional capacity and substitute decision-makers. The scenario functions as a probe to elicit differences in clinical reasoning, priorities and underlying values among physicians and physician trainees. In this context, the decision to prescribe or withhold antibiotics serves as an illustrative outcome through which broader determinants of decision-making can be examined.

The use of antibiotics in patients with advanced dementia is controversial. While antibiotics may (or may not) temporarily reduce patient discomfort,<sup>52</sup> it is a potentially curative treatment that can also prolong the patient's dying process and, for this patient, a life of considerable discomfort. Clinicians must also consider the burden associated with intravenous placement and hospitalisation. Instead, the objective of optimising comfort rather than prolonging life through symptomatic treatment of those patients exhibiting signs of distress might be a better option for managing discomfort without prolonging it.<sup>13 53</sup>

A similar survey was conducted exclusively with Canadian stakeholders and examined their attitudes toward withholding antibiotics from people with dementia lacking decisional capacity.<sup>54</sup> In contrast, our study extends this work by evaluating clinicians' decision-making across multiple countries with distinct cultural, religious and healthcare contexts, thereby enabling an explicit assessment of cross-cultural variation. Our study also incorporates physicians at different stages of medical training across culturally diverse regions, allowing us to explore how both training and cultural context jointly shape treatment decisions.

The results of this mixed-methods study will improve the understanding of how physicians and soon-to-be physicians perceive clinical care in advanced dementia. Furthermore, it may detect different perspectives according to cross-cultural aspects. Our findings will provide evidence on the cultural variability in the values and preferences of clinicians and clinicians-in-training in advanced dementia.

This study will also help clinicians to better comprehend not only the cultural environment in which they practise but also other cultural backgrounds. This is of high importance for clinicians working in multicultural environments or for those moving to practice in another cultural region.

Clinical practice guidelines addressing dementia will also benefit from our results. Our study will inform guidelines about the values and preferences of clinicians treating patients with advanced dementia, and this will also provide insights into patients' values and preferences. Finally, our findings will inform future efforts related to physician-focused interventions and changes to the educational programmes of medical students and residents.<sup>55</sup>

The strengths of this study include the integration of quantitative and qualitative approaches to not only identify aspects of participants' decision-making processes but also provide a deeper understanding of them. Limitations of this survey include the fact that clinicians' perspectives of the clinical management of patients with advanced dementia may not reflect the values and preferences of the general population. Despite the adoption of strategies to increase our response rates, such as survey simplicity and predetermination of a short timeframe for its completion, we acknowledge that respondents of this survey may not entirely reflect our target population (all physicians and medical students in each jurisdiction) and therefore the potential for response bias. Finally, we acknowledge that religiosity is measured across different domains.<sup>56</sup> However, to keep the survey simple and short, we will capture only one domain of the three domains (organisational religious activity, non-organisational religious activity and intrinsic religiosity) captured in the DUREL.<sup>28</sup>

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