FACULTAD DE MEDICINA
UNIVERSIDAD DE CANTABRIA

GRADO EN MEDICINA

TRABAJO FIN DE GRADO

Influence of level of studies on medical students' perception of need for end-of-life care.

Influencia del nivel de estudios alcanzado en alumnos de Medicina sobre la percepción de la necesidad de tratamientos de soporte al final de la vida.

Autor: D. Jorge Barros García-Imhof

Directora: Dª. Trinidad Dierssen Sotos

Codirector: D. Alejandro González Castro

Santander, junio 2020

TABLE OF CONTENTS

ABSTRACT

Objectives: The limitation of therapeutic effort during end-of-life care has been object of an intense debate throughout the medical community. The aim of this study was to analyse the different perspectives of medical students regarding these topics and identify characteristics associated with them. **Methods**: Q methodology analysis was performed to find profiles. A chi-square test was used to compare proportions. **Results**: 143 students participated. We obtained three opinion profiles. The first of the profiles seeks to ensure quality of life and attaches great importance to the patient's will; the second one puts life extension above anything else; and the third one advocates an equitable health system with no room for special cases. Those students who have religious beliefs are included in profile 2 in a greater proportion (48.8% vs 27.5%), while those who claim not to be religious or consider their beliefs do not influence their ethical principles are primarily included in profile 3 (48.5% vs 29.2%). **Conclusion:** Three profiles were identified on end-of-life care. Given the influence of beliefs and academic training on these viewpoints, the reinforcement of bioethics and health economics contents in medical schools' curricula would contribute to developing more knowledge-based opinion profiles.

Keywords: end-of-life care, medical students, opinion profile, Q methodology.

RESUMEN

Objetivos: La limitación del esfuerzo terapéutico en el contexto de los tratamientos de soporte al final de la vida ha generado un intenso debate en la comunidad médica. El objetivo de este estudio fue analizar los diferentes puntos de vista de los estudiantes de medicina sobre estos temas, e identificar características asociadas con los mismos. **Métodos:** Se realizó un análisis con metodología Q para hallar perfiles. Para comparar proporciones se utilizó un test chi-cuadrado. **Resultados:** 143 estudiantes participaron. Se obtuvieron tres perfiles de opinión. El primero de ellos busca garantizar la calidad de vida y el respeto a la voluntad del paciente; el segundo valora la extensión de la vida por encima de todo; y el tercero aboga por un sistema de salud equitativo, sin espacio para casos especiales. Los estudiantes que tienen creencias religiosas se incluyen en el perfil 2 en una mayor proporción (48.8% vs 27.5%), mientras que aquellos que no son religiosos o consideran que sus creencias no influyen sus principios éticos pertenecen principalmente al perfil 3 (48.5% vs 29.2%). **Conclusión:** Tres perfiles con respecto a los tratamientos de soporte al final de la vida fueron identificados. Considerando la influencia de las creencias y la formación académica en estos puntos de vista, el refuerzo de los contenidos de bioética y economía sanitaria en las facultades de medicina contribuiría a desarrollar perfiles de opinión más basados en el conocimiento.

Palabras clave: tratamientos de soporte al final de la vida, estudiantes de Medicina, perfil de opinión, metodología Q.

INTRODUCTION

Over the last decades life expectancy at birth in developed countries has increased gradually, and recent prospective studies show that it will keep increasing.[1] Advances in Medicine have provided us with tools that allow us to extend life in critical situations and, as a consequence, and together with the generalised declining birth rate, societies are experiencing a progressive ageing of population.[2,3]

The fact that we can artificially prolong life led to the emergence of a bioethical debate about the issue, which is still present today.[4] On the other hand, from an economic point of view, our limited resource system faces a great challenge, since global spending on health is expected to greatly increase in the next decades.[5]

Regarding bioethics and health economy, one of the most controversial issues over the last years has been the end-of-life care and the limitation of therapeutic effort. When life is coming to an end, it is important to feel comfortable and die with dignity, but there are different opinions on how and when we should let nature take its course.[2,4,6–8]

The limitation of therapeutic effort consists in deciding on the status and future of the patient to not apply treatments or therapeutic procedures that will provide little benefit about the suffering or agony the patient is experiencing.[8] Despite being well defined, there are many conditioning factors that may influence when time for decision making comes, most of them subjective and personal. In this context, training in bioethics and health economics could play a modulating role of the behaviours and attitudes of healthcare professionals regarding end-of-life care.

In Spanish medical schools, training in bioethics is usually limited to several lectures during one of the last years.[9,10] An analysis of different teaching-learning strategies in bioethics suggested that, in order to help medical students confronting ethical dilemmas, bioethics should become a transverse axis of the curriculum, from a multidisciplinary approach.[11] In the same manner, and noting that many medical schools do not routinely cover health economics in the curriculum,[12] it has been strongly recommended that medical students receive an adequate formation in this subject,[13] since the foundation of resource allocation is entwined with key ethical principles of distributive justice.[14]

The aim of this study was to identify medical students' different views on end-of-life care and to assess whether these views changed depending on factors related to the level of studies achieved and their background (convictions and experience with terminal patients).

METHODS

The design of our study involved, on the one hand, the development of a Q methodology study[15] in order to identify the views on end-of-life care in a medical students sample and, on the other hand, the analysis of the factors associated with the different profiles identified.

Q METHODOLOGY

Q methodology provides a scientific basis for the systematic study of subjectivity, identifying similarity patterns after the classification of a set of statements by respondents, a process known as “Q-sort.”[15,16]

To create a Q methodology survey, the following steps were performed. First of all, a set of statements of opinion was obtained, being the main element from which the study was then developed. After that, the selected study population was invited to participate. Finally, an analysis of the results obtained was performed, and the different patterns of opinion were identified and characterised. These steps are described in detail below.

THE STATEMENT SET

The first step consisted of obtaining a set of statements of opinion, representative of different views on situations relating with the provision of end-of-life treatments, which were presented to respondents so that they sorted them according to their ethical values and own experiences.

A review of articles that evaluated opinions on end-of-life care was carried out. One study amongst the analysed literature stood out – McHugh et al., 2015, addressing societal perspectives about end-of-life care – since we considered that the set of statements they used fitted our requirements.[17] A further selection was made, considering aspects such as the cultural differences between both workplaces and legislative and health policy differences. Those statements found repetitive, ambiguous or unclear were dismissed, resulting in a final set of 28 statements out of the 49 they used (see Table 1).

STUDY POPULATION AND DATA COLLECTION

The second step involved identifying respondents and sending them the survey.

Our participants were selected amongst the University of Cantabria’s School of Medicine’s students. Students from each of the six years of the degree were asked to participate in the study and share the link to the online questionnaire with their classmates, via email and WhatsApp. The link was active from November 2019 until January 2020.

The questionnaire had three sections. In the first section, students had to complete an informed consent in order to participate in the study. The second section consisted of the Q sets explained above. Finally, the third section of the questionnaire, was composed of a set of socio-demographic questions which included age, gender and year of studies. In addition, respondents were asked for their average grade and parents’ education level. Questions about religion, personal experiences with terminal patients – either as a relative or as a friend –, and hospital contact with these kind of patients as a student, were introduced as well.

Finally, respondents were asked about the influence they considered these factors might have in their current views and thoughts towards end-of-life care.

The questionnaire was built in an online-based platform in order to make the handling of Q-sorts easier (which frequently involves rethinking and changing positions between previously sorted statements)[18] and thus, improve participation. To this end, we used Easy-HtmlQ (an open source licence app developed in HTML5 and JavaScript). An adaptation was made on the platform to allow the inclusion of the informed consent at the beginning and the set of socio-demographic questions at the end. In addition, a brief explanation was included before every part of the survey. The Easy-HtmlQ online platform was deployed using, on the one hand, Netlify web hosting services and, on the other hand, Google's Firebase tool for storing data.

Then, the Q-sort process started, first by classifying the set of statements, based on whether they agreed, disagreed, or had a neutral opinion about them. It was not until they classified a sentence that they could read the following one, so that they focused on each one separately and not as a whole.

In the next step, respondents were asked to sort and position these statements on a response grid, known as "Q-grid" (see Figure 1). They started by ranking the statements with which they had previously agreed. First, they chose those two statements with which they agreed the most (+3), following with the four which they considered to be +2 and ending with the five statements for the +1 position. The same process took place from the left side, placing the previously classified as disagree statements in the -3, -2 and -1 columns.

In the end, the remaining statements, those that had been sorted as neutral, were placed in the 0 position. However, in most cases there were not the same number of 0 spots than of statements marked as neutral; sometimes there were more than 6 neutral statements and, in other cases, there were more agree or disagree statements than positions for them. When this happened, they had to place the statements in the remaining places. This last step of the Q-sort ensured that respondents had to double-check their previous choices, since they were forced to decide which sentence deserved the most each place, even if previously they had sorted them as equals.

STATISTICAL ANALYSIS

The Q method analysis was performed in Ken-Q Analysis v1.0.3, a specific Web Application for Q Methodology.[19] The analytical process involved two parts. Firstly, a principal component analysis (PCA) was done, in which the respondents (instead of the variables) are correlated in order to identify the number of natural grouping of Q sort. Secondly, a particular Q method analysis was developed. This analysis consisted of three phases: (1) flagging the Q sort that defines each factor, (2) calculating the score of statements for each factor and (3) finding the distinguish and consensus statements. The standard analytical process in Q methodology has been previously described in detail.[20,21]

Finally, after defining the different opinion patterns, a chi-square test was performed to identify the factors related to each pattern. This statistical analysis was developed with the statistical package STATA vs 16.0.

ETHICS

This study has been approved by the Research Project Ethics Committee of The University of Cantabria (CE TFG 12/2019). All respondents were invited to read the information sheet and sign the informed consent. Personal data were anonymized.

RESULTS

STUDY POPULATION

The link to the survey was distributed amongst the students of the six years of the degree (773 in total), obtaining 143 responses, which means a response rate of 18.5%. The characteristics of the 143 respondents are presented in Table 2. Mean age was 22.1 (SD: 2.68) years. About a third of participants (29.4%) were in first, second or third year of their medical studies, whereas the remaining two thirds (70.6%) were in fourth, fifth or sixth year. 98 out of the 143 (68.5%) respondents were women. As for the students' origin, 54.5% came from Cantabria, and the rest were distributed amongst other 26 Spanish provinces, mostly from Asturias (14%) and Madrid (4.9%).

FACTORS

We selected the three factors explaining more variance (56%); all these factors were interpretable, so from here on we will refer them as profiles 1, 2 and 3. 121 respondents (84.6% of the sample) could be included in one of these profiles and 22 (15.4%) could not be classified so they were excluded from the statistical analysis.

Profiles are characterized by the statements that distinguish one from another; from here on, each statement will be presented followed by its number, its position on the Q-grid (from -3 to +3), and an * in case of a distinguishing factor, as done in other studies.[17,22] For instance, when describing profile 1, we use (#5, 0*), which indicates that it is statement #5 in Table 3 ("I would place more value on end-of-life treatments than many medical treatments for non-terminal conditions"); it has scored 0 in people with profile 1 and this sentence allows to distinguish this profile from profiles 2 and 3. There are just two out of the 28 presented statements to which all factors showed the same level of agreement. Depending on the difference of the Z-score value between the three factors, we can consider these statements as consensus statement or not.[23] For example, in #4: "It is important to give a dying person and their family time to prepare for their death, put their affairs in order, make peace and say goodbyes", the three factors agreed with +2, and the difference of the Z-score between them was only of 0.16, so we identified it as a consensus statement.

FACTOR 1: EXTENDING LIFE – PATIENT'S WILL AND QUALITY OF LIFE

The first of the three factors accounts for 17.5% of the sample (25 respondents). Figure 2 shows the composite Q-sort for this group.

People holding this view are distinguished from the rest in the fact that they do not express preference in statements that are closely related to will or perceptions of the terminal patients or their relatives: "Extending life for people with terminal illnesses is only postponing death" (#21, 0*) or "I would place more value on end-of-life treatments than many medical treatments for non-terminal conditions" (#5, 0*). They worry about the patient's will, respecting their power to decide about their own life: "If somebody wants to keep fighting until the last possible moment, they should be allowed to do so, regardless of cost" (#3, 2).

They neither defend life at any cost: "Life is sacred and if it is possible to preserve life, every effort should be made to do so" (#22, -3); "It is human nature to want to preserve life and go on living for as long as we can – it is one of our most basic instincts” (#7, -1*), nor would encourage a terminal patient to prolong his life unless ensuring a good quality of life: “Real help and compassion should be about providing a death with dignity instead of more drugs to get a few more weeks or months out of a very sick body” (#11, 2).

This view leaves the economic matter into the background, justifying any treatment regardless of how expensive it might be: “Everyone has a right to basic healthcare but there has to be limits and expensive, end-of-life, drugs are not basic care” (#24, -3*); “Expensive drugs for people who are terminally ill and won’t benefit very much are not a good use of public funding” (#6, -2); “Treatments that are very costly in relation to their health benefits should be withheld” (#17, -2).

Finally, respondents of this group show a special sensitivity towards terminal patients: “I think life-extending treatments for people who are terminally ill are of less value as people get older” (#26, -2).

In summary, this group is characterised for respecting the patient’s decisions, worrying about their quality of life, not just the extension, and justifying any health expenditure related with end-of-life care provided that the patient approves it.

FACTOR 2: EXTENDING LIFE – AT ALL COSTS

The second factor accounts for 29.4% of the sample (42 respondents). Figure 3 shows its composite Q-sort.

People with this view advocate life extension in any case: “It is human nature to want to preserve life and go on living for as long as we can – it is one of our most basic instincts” (#7, 2*); “If the means of helping someone live longer exists, it is morally wrong to deny them the treatment” (#15, 2*); “Extending life for people with terminal illnesses is only postponing death” (#21, -3*).

They defend life at any cost: “If somebody wants to keep fighting until the last possible moment, they should be allowed to do so, regardless of cost” (#3, 2). In contrast to the other views, they reject euthanasia since it is presented as a measure of health expenditure control, and this is not a primary concern for them: “An objective measure of health expenditure control could be to legalize the euthanasia process” (#28, -1*).

Consequently, respondents included in this profile maintain that every effort should be made to prolong life, even if it is for a short time: “It may not sound like much, but a few extra weeks or months might mean an awful lot to a family affected by a terminal illness” (#9, 3*); “It´s important to provide life-extending treatments to give a dying person time to reach a significant milestone, like a family event or a personal achievement” (#25, 1*); “Treatments that provide a short life extension are not worth it – they are only prolonging the pain for the patient’s family/friends” (#20, -3*); “End-of-life drugs are not a cure, they are life-prolonging. There is no point in delaying the inevitable for a short time” (#18, -2*); “Patients at the end of life will grasp any slightest hope but that is not a good reason for the NHS to provide costly treatments that may extend life by a short time” (#19, -2*).

In the same manner as people from profile 1, they consider terminal patients are worthy of a special attention, even if they accept that despite greater spending, important health gains are not expected: “Treatments that are very costly in relation to their health benefits should be withheld” (#17, -2); “I think life-extending treatments for people who are terminally ill are of less value as people get older” (#26, -2).

Due to the force of the next two statements, and despite people from this group do not agree with them, the fact that they do not even reject them is an indicator of how much they respect life: “Not giving access to life-extending medicine to a person with a terminal illness is the same as killing them” (#16, 0*); “Life is sacred and if it is possible to preserve life, every effort should be made to do so” (#22, 0*).

Respondents included in this profile do not show a clear position (neither agreement nor disagreement) in those statements aimed at evaluating the expected quality of life of a patient with a terminal illness. In this case, similarly as the previous paragraph, the fact that they do not reject them suggest that they prioritise life extension rather than quality of life: “At the end of their life, patients should be cared for at home with a better quality of life rather than have aggressive and expensive treatments that will only extend life for a short period of time” (#2, 0*); “Life should only be extended if the patient's quality of life during that time will be good” (#10, 0*); “Real help and compassion should be about providing a death with dignity instead of more drugs to get a few more weeks or months out of a very sick body” (#11, 0*).

Finally, when the moral problem of prolonging the life of a terminally ill patient ("Prolonging life in a beneficial way for the patient is morally correct") is assessed, this profile does not show a clear position (#14, 0*). In contrast, respondents in the other two profiles strongly disagree with this statement

In conclusion, this account is based on a deep respect of life, setting economic aspects aside, and leaving the principles of distributive justice in the background. People included in this group consider that every available treatment should be provided, regardless of its cost and the inequalities it might cause in the Public Health System.

FACTOR 3: EXTENDING LIFE – HEALTH EQUITY, NO SPECIAL PATIENTS

The third factor is the one that includes more respondents, accounting for 37.8% of the sample (54 participants). Figure 4 shows the composite Q-sort for factor 3.

The main difference of this profile with the other two is the fact that they consider that the Public Health System must be equal to everyone, denying special benefits to terminal patients: “Patients at the end of life will grasp any slightest hope but that is not a good reason for the NHS to provide costly treatments that may extend life by a short time” (#19, 1*) ; “I would place more value on end-of-life treatments than many medical treatments for non-terminal conditions” (#5, -2*); “If somebody wants to keep fighting until the last possible moment, they should be allowed to do so, regardless of cost” (#3, -1*). Despite this group’s perspective, which focuses more on the whole population rather than the individual, they do not put aside the patient’s will: “Patients should have the right to refuse life-extending treatments if they choose” (#1, 3*).

In addition, they do not express a preference regarding the sentences that imply a greater expenditure in end-of-life care: “If a life-extending treatment for terminally ill patients is expensive, but the only treatment available, it should still be provided” (#8, 0*); “We should spend proportionately more on patients when we feel those patients have not had their fair innings – in terms of the length of their life or the quality of that life” (#13, 0*); “Treating people at the end of life is not going to result in big health gains but the health system should be about looking after those patients in greatest need” (#27, 0*).

Unlike respondents from profile 2, people included in this profile strongly reject to extend life just to keep the patient alive, disagreeing with the statements which advocate this idea: “Life is sacred and if it is possible to preserve life, every effort should be made to do so” (#22, -3); “A year of life is of equal value for everyone” (#12, -3*); “Not giving access to life-extending medicine to a person with a terminal illness is the same as killing them” (#16, -2*); “To extend life in a way that is beneficial to the patient is morally the right thing to do” (#14, -2).

On the other hand, respondents from this group present some similarities with group 1, since they consider that life extension is only worth and ethic if it results in actual health gains, not just stopping death from happen: “I wouldn’t want my life to be extended just for the sake of it – just keeping breathing is not life” (#23, 3); and provided quality of life will be good: “Life should only be extended if the patient’s quality of life during that time will be good” (#10, 2); “Real help and compassion should be about providing a death with dignity instead of more drugs to get a few more weeks or months out of a very sick body” (#11, 2).

In summary, this group of respondents show a more societal viewpoint if compared to the other two, giving more importance to the population as a whole, making sure everyone gets the same benefits from the Health System, than individualising to each patient’s situation. Besides, they advocate for maintaining a good quality of life and respecting patient’s will during their last days.

CHARACTERISTICS ASSOCIATED WITH THE PROFILES

Respondents’ characteristics associated with the profiles are presented in Table 4.

The only two variables that were found to be significantly associated with the profiles were the respondents’ religious beliefs and the influence they considered these beliefs carried on their ethical principles. Those students who profess to have religious beliefs are included in profile 2 in a much greater proportion (48.8% vs 27.5%), while those who claim not to be religious or consider their beliefs do not influence their ethical principles are included in a greater proportion in profile 3 (48.5% vs 29.2%).

In addition, we identified some aspects that showed important differences in their distribution between the profiles, although without reaching statistical significance.

Regarding the influence of the academic record, the third profile predominates in last-year students (56.5%), as well as in those respondents with the highest average grade (>8/10) (60.0%). On the other hand, students who reported previous experiences with terminally ill patients during their clerkship belong to the first profile in a greater proportion (25.0% vs 17.5%). Those who considered that their personal experiences influenced their attitude towards end-of-life care show a clear predominance of profile 2 (45.5%), while those who were not influenced by this factor are in profile 3 in a greater proportion (52.2%).

Those respondents whose two parents completed university studies are evenly distributed amongst profile 2 and 3; however, in those cases when one of the parents did not achieve university studies profile 3 predominates. The third profile also predominates in students living with their families (49.1%) and in those who have not had any contact with terminal patients during their clinical clerkship (47.5%).

No differences associated to sex or age were found.

DISCUSSION

The aim of our study was to identify and describe the different views of our Medical School students towards end-of-life care, assessing the relative value of highly cost treatments for terminally ill patients and exploring the students' perspective about the ethical and moral dilemmas that these topics bring about.

Our study identified three main profiles amongst the students' opinions. The first view (extending life – patient's will and quality of life) leaves in the background health economics and focuses on respecting the patient's choice regarding his own life, provided the expected quality of life is good. The second profile (extending life – at all costs) is similar to the previous one regarding economic aspects, since they spare no expenses on treatments for terminally ill patients; however, people conforming this view think every patient should have the chance to prolong his life to the limit, leaving the quality aspect aside. The last profile (extending life – health equity, no special patients) differs from the previous two on their economic outlook: they support an equal system to every patient, in which nobody deserves being treated as different or special, regardless of their condition. In this respect, and in contrast with the other two profiles, they advocate a greater control of health expenditure and support the limitation of therapeutic effort. Nevertheless, they resemble the first profile in the sense that they show a great respect for the patient's will and are great defenders of a good quality of life

On the other hand, we identified one consensus statement (#4). Consensus factors usually identify those situations that are always difficult to accept or reject, regardless of that group's opinion about the rest of presented matters, but they also identify ambiguous statements or even situations in which respondents do not want to express commitment because they tackle taboo issues.[23] After analysing the different profiles, we realised that this consensus statement lacked all the ideas that provoked rejection or acceptance towards the rest of the statements, since it does not asses economic (cost of care) or moral aspects (preservation of lifetime). Furthermore, it accepts death, showing an empathic view towards the dying person, which makes it difficult for everyone to disagree.

Consistently with our results, several studies assessing end-of-life care beliefs[17,22,24] identified similar profiles. McHugh et al., described a group of people in which "patients' rights are central and life is regarded as precious and priceless so even high cost treatments that deliver limited benefits should not be withheld from patients", and another group whose main view was "to achieve the greatest health gains for the greatest number through the efficient allocation of limited resources", which clearly correspond to our factors 2 and 3. They also described a third group of people for whom quality of life was one of their main concerns, similarly as respondents included in our first profile, but it differed from ours on the patient's will aspect. In our study, this profile prioritizes the patient's willingness – justifying the provision of any possible treatment if the patient asks for it. In contrast, the third profile identified by McHugh et al. focuses only on the quality of life aspect.[17] In the same line, Wouters et al.[22], also described three profiles. Two of them are similar to our profiles 1: "the care that terminal patients receive should at all times respect the patients' quality of life and dignity" and 3, which emphasizes "the importance of equality in opportunities and hence access to healthcare" and "denies giving priority in any circumstance, because assigning priority to some patients at the cost of others conflicts with every person's basic and equal right to healthcare". The remaining profile focuses on cost-effectiveness, considering it the main criterion for decision-making. This aspect could fit in the description of our third profile;

nevertheless, people included in this profile “have no moral objection to priority setting”, and “believe that priority should be given to treatments that generate the most health and patients who benefit most from treatment”, which is clearly opposite to our third profile and to the similar one they described.[22] Finally, Van Exel et al., identified 5 viewpoints, being three of them very similar to our profiles 1: “Quality of life is more important than simply staying alive”, 2: “The intrinsic value of life and healthy living”, and 3: “Egalitarianism, entitlement and equality of access”. The other two profiles they found were based on the magnitude of health gains and the relevance of patient’s age in priority setting.[24] The fact that their sample was composed of people from ten different countries with a wide age range and varying socio-economic and health status, as well as the larger set of statements (34 vs 28) they used, probably increased the variability of opinions, and may be the reason why they described five different profiles.

Finally, the factors associated with these three profiles were identified. Students about to complete their medical degree have already received training in bioethics and spend most of the year performing their clinical clerkship, which puts them in contact with the actual situation of the National Health System. This first contact has been suggested to be the most powerful factor that influences self-perceived attitudes towards end-of-life care.[25] In our case, we found that respondents who reported previous contact with terminal patients were included in profile 1 (extending life – patient’s will and quality of life) in a greater proportion than those who did not have previous experiences with these patients. This profile focuses on preserving quality of life, an aspect that medical students do not contemplate until they complete their clinical training and start dealing with patients. In this respect, a more in-depth, standardized practical training for medical and nursing students has been considered to be necessary in order to ensure an adequate end-of-life care provision, especially regarding the humane component and empathy that professionals must show.[26] A previous study assessing medical students’ views on the development of empathic behaviour towards patients revealed that early patient contact and clinical skills and communication courses were found by the students to be very helpful in order to foster their ability to empathise with patients.[27]

Respondents who claimed to be religious were found to be more likely included in the second profile (extending life – at all costs) than in the other two. In this regard, only those amongst this group who were practising and considered their religious beliefs to influence their view on end-of-life care were more likely to find themselves in the second profile, whereas the ones who considered not being influenced by religion were predominantly included in the third profile. Given that more than 60% of Spanish population declare to be Catholic – although just around 20% are practising – ,[28] we will discuss the results referring to this religion. People included in this profile support preservation of life in any case, regardless of the patient’s condition, which concurs with the defence of life that Christianity advocates, presenting life as a gift from god which has to be protected.[29] Only one study using Q methodology analysed the influence of religion and suggested that participants who place a high value on life might be influenced by their religious beliefs.[24] In the same line, studies using other methodologies have shown that medical students who state to have an active religious belief are likely to disagree with actions that hasten death,[30] consistently with the findings of our study.

In this connection, it has been suggested that being a last-year student is associated with a greater likelihood of agreeing with actions that precipitate death in a terminally ill patient,[30] which concurs with our third profile (extending life – health equity, no special patients). The fact that more than half of the last-year students (56.5%) were included in this profile could be partially explained by the influence of the knowledge acquired through their degree. It can be speculated that, as a result of a six-year process of knowledge acquisition, students incorporate economic aspects in their overall viewpoint of health. In this line, they believe that the Public Health System must maximise the whole population's health gains, promoting an equitable public funds allocation and an adequate provision of end-of-life care. It has been suggested that a formal curriculum in health systems and health policy should be an essential component of medical education, and that students should be provided with this training prior to their third year, so that they can integrate their clinical experiences into a broader framework.[31] A review of the literature on health policy training revealed that most programmes focused exclusively on the impact of health policy training in the context of health care. Therefore, the reviewers urged to widen the scope and consider taking into consideration public health and the spectrum of non-health sectors that impact population health as well.[32]

LIMITATIONS AND STRENGTHS

There are some limitations in our study that should be mentioned. Firstly, since our sample is composed exclusively of students from a single medical school, it might seem that the results obtained cannot be applicable to the whole Spanish medical student population. However, curricula and study programmes throughout the country are very similar. In addition, those of newly opened centres, must be approved by a national agency (ANECA, National Agency for Quality Assessment and Accreditation), member of the European and International Association for Quality Assurance in Higher Education, in order to ensure equality and standardisation between graduates of every school.[10,33] Therefore, we believe that the medical students of our School represent quite well the Spanish community of medical students. Secondly, the low participation rates of students in the lower years prevents us from exploring in detail how being in a particular year of the degree determines the profile. However, we were able to separately analyse the role of clinical experience, because more than half the students in the last year of the degree participated in the survey. This matter is especially relevant given that one of our objectives was to study the influence of clinical experience in the attitudes towards the terminally ill. Thirdly, statistical power was limited for the analyses of associated factors, due to the small number of exposed in some of the different subgroups. However, this issue did not affect the Q methodology analysis. Despite the low response rate, the characteristics of the study population were not altered in the sample, since the proportion of women was similar (68.5% in the sample vs 71.7% in the population) and we obtained questionnaires from respondents of 27 different Spanish provinces, since our medical school attracts students from other parts of Spain.

To the best of our knowledge, this is the first time that a study evaluates opinions on bioethics and end-of-life care applying Q methodology to a sample composed exclusively of medical students. This strategy allows an in-depth analysis of the different profiles of medical students on a matter we consider of crucial importance on their future professional life.

Previous studies have used more heterogeneous samples, assessing students' views but also those of others members of the public, such as researchers and health policy makers, which may mask students' opinion on the matter.[34] Similar studies have highlighted the need for further research on students' perception of end-of-life care, as well as medical schools' approach to the subject.[35–37]

Although other methodologies have proven to be useful for studying public views on end-of-life care and health economics,[38] such as budget allocation[39,40] or willingness-to-pay,[41,42] we picked Q methodology since we wanted to obtain a broader view of the different patterns of opinion amongst the students. Achieving this goal would have been difficult using any of the other methodologies, considering that they mostly explore specific scenarios.

CONCLUSION

Three different viewpoints on end-of-life care amongst medical students have been revealed in this study. These profiles are influenced by personal factors (beliefs, experience with terminally ill patients) and other aspects related to the academic training received. Taking these results into account, the reinforcement of bioethics and health economics, often overlooked in medical schools' curricula, would contribute to developing more knowledgeable opinion profiles, instead of students relying on personal experiences on these topics.

These two areas of knowledge are of essential significance in order to help our medical students – and the future professionals who they will shortly become – to deal with difficult situations related to the topics we have addressed. We also need to bear in mind that these are the professionals that will most likely contribute to creating policies that regulate matters as complex as end-of-life care. Hence, training in these areas should be considered a priority by the whole academic and medical community.

FUNDING

This work has been funded by a grant from the Ministerio de Educación (Beca de colaboración).

ACKNOWLEDGEMENTS

I would like to mention several people who have greatly contributed to the completion of this study.

First of all, I must thank the director of the study, Ms. Trinidad Dierssen, for her continuous support throughout the whole process. Despite being the first time that I perform a study of this kind, I have always found in her a quick answer to all my doubts, as well as a great deal of helpful advice. Her kind words and suggestions and the thorough review work she has carried out are largely responsible for the successful completion of the study. Even in difficult times, she has always been there to provide me with guidance, for which I feel very grateful.

Secondly, I would like to express my gratitude to Mr. Alejandro González, codirector of the study, whose previous work and experience on the field of the study has greatly contributed to my understanding of the subject, and thus to the successful realization of the task.

Finally, I have to thank Ms. María Fernández, who has enormously facilitated the process of data collection by designing an intuitive and attractive online platform, which I am sure has boosted participation.

REFERENCES

1. Kontis V, Bennett JE, Mathers CD, Li G, Foreman K, Ezzati M. Future life expectancy in 35 industrialised countries: projections with a Bayesian model ensemble. *Lancet*. 2017;389(10076):1323-1335. doi:10.1016/S0140-6736(16)32381-9

2. Derse AR. Limitation of Treatment at the End-of-Life: Withholding and Withdrawal. *Clin Geriatr Med*. 2005;21(1):223-238. doi:10.1016/j.cger.2004.08.007

3. England K, Azzopardi-Muscat N. Demographic trends and public health in Europe. *Eur J Public Health*. 2017;27:9-13. doi:10.1093/eurpub/ckx159

4. Kirsch RE, Balit CR, Carnevale FA, Latour JM, Larcher V. Ethical, Cultural, Social, and Individual Considerations Prior to Transition to Limitation or Withdrawal of Life-Sustaining Therapies. *Pediatr Crit Care Med*. 2018;19(8S Suppl 2):S10-S18. doi:10.1097/PCC.0000000000001488

5. Dieleman JL, Templin T, Sadat N, et al. National spending on health by source for 184 countries between 2013 and 2040. *Lancet*. 2016;387(10037):2521-2535. doi:10.1016/S0140-6736(16)30167-2

6. Shreves A, Marcolini E. End of life/palliative care/ethics. *Emerg Med Clin North Am*. 2014;32(4):955-974. doi:10.1016/j.emc.2014.07.010

7. Wiegand DL, MacMillan J, Dos Santos MR, Bousso RS. Palliative and end-of-life ethical dilemmas in the intensive care unit. *AACN Adv Crit Care*. 2015;26(2):142-150. doi:10.1097/NCI.0000000000000085

8. Borsellino P. Limitation of the therapeutic effort: Ethical and legal justification for withholding and/or withdrawing life sustaining treatments. *Multidiscip Respir Med*. 2015;10(1):1-5. doi:10.1186/s40248-015-0001-8

9. Universidad de Cantabria. Guía Docente de la Asignatura: Medicina Legal, Bioética y Toxicología Forense. 2019. https://web.unican.es/estudios/Documents/Guias/2019/es/G131.pdf. Accessed January 4, 2020.

10. ANECA (Agencia Nacional de Evaluación de la Calidad y Acreditación). Libro Blanco. Título de Grado en Medicina. 2005. http://www.aneca.es/var/media/150312/libroblanco_medicina_def.pdf.

11. Molina N. Bioethics training in health sciences. *Cienc y Tecnol para la salud Vis y Ocul*. 2016;14(1):117-132.

12. Beecroft C. Why health economics deserves a place in the medical curriculum. *J Comp Eff Res*. 2016;5(4):321-323. doi:10.2217/cer-2016-0028

13. Ashraf MA, Sherwani Y, Najim M, et al. Should basic health economics principles be taught during medical school in the UK? *Med Educ Online*. 2015;20(1). doi:10.3402/meo.v20.29541

14. Leget C, Hoedemaekers R. Teaching medical students about fair distribution of healthcare resources. *J Med Ethics*. 2007;33(12):737-741. doi:10.1136/jme.2006.017095

15. Watts S, Stenner P. *Doing Q Methodological Research: Theory, Method & Interpretation*.; 2012. doi:10.4135/9781446251911

16. McKeown B, Thomas D. *Q Methodology*. 2455 Teller Road, Thousand Oaks California 91320 United States : SAGE Publications, Inc.; 2013. doi:10.4135/9781483384412

17. McHugh N, Baker RM, Mason H, et al. Extending life for people with a terminal illness: A moral right and an expensive death? Exploring societal perspectives. *BMC Med Ethics*. 2015;16(1):1-15. doi:10.1186/s12910-015-0008-x

18. Watts S. Develop a Q methodological study. *Educ Prim Care*. 2015;26(6):435-437. doi:10.1080/14739879.2015.1101855

19. Banasick S. Ken-Q Analysis (Version 1.0.3) [Software]. *Zenodo*. 2018. doi:10.5281/zenodo.1300189

20. Brown SR. Political Subjectivity: Applications of Q Methodology in Political Science. January 1980.

21. Zabala A, Sandbrook C, Mukherjee N. When and how to use Q methodology to understand perspectives in conservation research. *Conserv Biol*. 2018;32(5):1185-1194. doi:10.1111/cobi.13123

22. Wouters S, van Exel J, Baker R, B.F. Brouwer W. Priority to End of Life Treatments? Views of the Public in the Netherlands. *Value Heal*. 2017;20(1):107-117. doi:10.1016/j.jval.2016.09.544

23. Zabala A, Pascual U. Bootstrapping Q Methodology to Improve the Understanding of Human Perspectives. *PLoS One*. 2016;11(2):1-19. doi:10.1371/journal.pone.0148087

24. van Exel J, Baker R, Mason H, Donaldson C, Brouwer W. Public views on principles for health care priority setting: Findings of a European cross-country study using Q methodology. *Soc Sci Med*. 2015;126:128-137. doi:10.1016/j.socscimed.2014.12.023

25. Kim DY, Kim KJ, Shin SJ, Heo DS, Lee SN, Nam EM. Factors That Influence Attitudes Toward End-of-Life Care Among Medical Students: Nationwide Survey for Fourth-Year Korean Medical Students. *Am J Hosp Palliat Med*. 2019;36(6):460-465. doi:10.1177/1049909118822287

26. Sutherland R. Dying Well-Informed: The Need for Better Clinical Education Surrounding Facilitating End-of-Life Conversations. *Yale J Biol Med*. 2019;92(4):757-764. http://www.ncbi.nlm.nih.gov/pubmed/31866792. Accessed January 23, 2020.

27. Pohontsch NJ, Stark A, Ehrhardt M, Kötter T, Scherer M. Influences on students' empathy in medical education: An exploratory interview study with medical students in their third and last year. *BMC Med Educ*. 2018;18(1). doi:10.1186/s12909-018-1335-7

28. CIS (Centro de Investigaciones Sociológicas). *Barómetro de Julio 2019*.; 2019.

29. Stempsey WE. End-of-life decisions: Christian perspectives. *Christ Bioeth*. 1997;3(3):249-261. doi:10.1093/cb/3.3.249

30. Pomfret S, Mufti S, Seale C. Medical students and end-of-life decisions: the influence of religion. *Futur Healthc J*. 2018;5(1):25-29. doi:10.7861/futurehosp.5-1-25

31. Riegelman R. Commentary: Health systems and health policy: A curriculum for all medical students. *Acad Med*. 2006;81(4):391-392. doi:10.1097/00001888-200604000-00014

32. Heiman HJ, Lerissa Smith L, McKool M, Mitchell DN, Bayer CR. Health policy training: A review of the literature. *Int J Environ Res Public Health*. 2015;13(1). doi:10.3390/ijerph13010020

33. Misión - Aneca. http://www.aneca.es/ANECA/Mision. Accessed March 27, 2020.

34. Stolk EA, Pickee SJ, Ament AHJA, Busschbach JJV. Equity in health care prioritisation: An empirical inquiry into social value. *Health Policy (New York)*. 2005;74(3):343-355. doi:10.1016/j.healthpol.2005.01.018

35. Cucalón-Arenal JM, Marín-Ibáñez A, Cía-Gómez P, Blay-Cortés MG. Opinión de los universitarios sobre los cuidados al final de la vida. *FEM Rev la Fund Educ Médica*. 2013;16(3):181-186. doi:10.4321/s2014-98322013000300009

36. Hammel JF, Sullivan AM, Block SD, Twycross R. End-of-life and palliative care education for final-year medical students: A comparison of Britain and the United States. *J Palliat Med*. 2007;10(6):1356-1366. doi:10.1089/jpm.2007.0059

37. Wilson H, Warmington S, Johansen ML. Experience-based learning: junior medical students' reflections on end-of-life care. *Med Educ*. 2019;53(7):687-697. doi:10.1111/medu.13907

38. Shah KK, Tsuchiya A, Wailoo AJ. Valuing health at the end of life: A review of stated preference studies in the social sciences literature. *Soc Sci Med*. 2018;204:39-50. doi:10.1016/j.socscimed.2018.03.010

39. Linley WG, Hughes DA. Societal views on nice, cancer drugs fund and value-based pricing criteria for prioritising medicines: A cross-sectional survey of 4118 adults in great britain. *Heal Econ (United Kingdom)*. 2013;22(8):948-964. doi:10.1002/hec.2872

40. Chim L, Salkeld G, Kelly P, Lipworth W, Hughes DA, Stockler MR. Societal perspective on access to publicly subsidised medicines: A cross sectional survey of 3080 adults in Australia. *PLoS One*. 2017;12(3):e0172971. doi:10.1371/journal.pone.0172971

41. Shiroiwa T, Sung YK, Fukuda T, Lang HC, Bae SC, Tsutani K. International survey on willingness-to-pay (WTP) for one additional qaly gained: What is the threshold of cost effectiveness? *Health Econ*. 2010;19(4):422-437. doi:10.1002/hec.1481

42. Pennington M, Baker R, Brouwer W, et al. Comparing WTP values of different types of QALY gain elicited from the general public. *Heal Econ (United Kingdom)*. 2015;24(3):280-293. doi:10.1002/hec.3018

ANNEX 1:
TABLES AND FIGURES

1. Patients should have the right to refuse life-extending treatments if they choose.
2. At the end of their life, patients should be cared for at home with a better quality of life rather than have aggressive and expensive treatments that will only extend life for a short period of time.
3. If somebody wants to keep fighting until the last possible moment, they should be allowed to do so, regardless of cost.
4. It is important to give a dying person and their family time to prepare for their death, put their affairs in order, make peace and say goodbyes.
5. I would place more value on end-of-life treatments than many medical treatments for non-terminal conditions.
6. Expensive drugs for people who are terminally ill and won't benefit very much are not a good use of public funding.
7. It is human nature to want to preserve life and go on living for as long as we can - it is one of our most basic instincts
8. If a life-extending treatment for terminally ill patients is expensive, but the only treatment available, it should still be provided
9. It may not sound like much, but a few extra weeks or months might mean an awful lot to a family affected by a terminal illness
10. Life should only be extended if the patient's quality of life during that time will be good.
11. Real help and compassion should be about providing a death with dignity instead of more drugs to get a few more weeks or months out of a very sick body.
12. A year of life is of equal value for everyone.
13. We should spend proportionately more on patients when we feel those patients have not had their fair innings - in terms of the length of their life or the quality of that life.
14. To extend life in a way that is beneficial to the patient is morally the right thing to do.
15. If the means of helping someone live longer exists, it is morally wrong to deny them the treatment.
16. Not giving access to life-extending medicine to a person with a terminal illness is the same as killing them.
17. Treatments that are very costly in relation to their health benefits should be withheld.
18. End-of-life drugs are not a cure, they are life-prolonging. There is no point in delaying the inevitable for a short time.
19. Patients at the end of life will grasp any slightest hope but that is not a good reason for the NHS to provide costly treatments that may extend life by a short time.
20. Treatments that provide a short life extension are not worth it - they are only prolonging the pain for the patient's family/friends.
21. Extending life for people with terminal illnesses is only postponing death.
22. Life is sacred and if it is possible to preserve life, every effort should be made to do so.
23. I wouldn't want my life to be extended just for the sake of it - just keeping breathing is not life.
24. Everyone has a right to basic healthcare but there has to be limits and expensive, end-of-life, drugs are not basic care.
25. It's important to provide life-extending treatments to give a dying person time to reach a significant milestone, like a family event or a personal achievement.
26. I think life-extending treatments for people who are terminally ill are of less value as people get older.
27. Treating people at the end of life is not going to result in big health gains but the health system should be about looking after those patients in greatest need.
28. An objective measure of health expenditure control could be to legalize the euthanasia process.

Table 1. Set of statements.

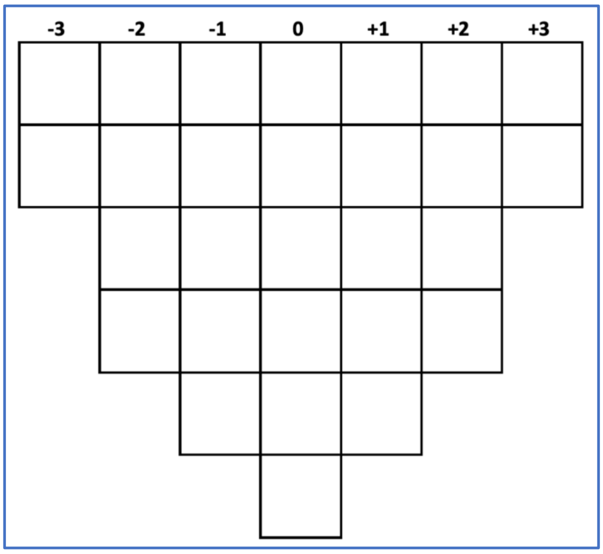


Figure 1. Q-grid.

Variable	Category	All respondents N=143 N(%)	Respondents with profile N=121 N(%)
Gender	Male	45(31.47)	39(32.23)
	Female	98(68.53)	82(67.77)
Year of studies	First to third-grade students	42(29.37)	37(30.58)
	Fourth to fifth-grade students	48(33.57)	38(31.40)
	Sixth-grade students	53(37.06)	46(38.02)
Start year	2013	8(5.59)	6(4.96)
	2014	50(34.97)	44(36.36)
	2015	26(18.18)	22(18.18)
	2016	15(10.49)	11(9.09)
	2017	19(13.29)	17(14.05)
	2018	15(10.49)	11(9.09)
	2019	10(6.99)	10(8.26)
Origin	Another province	65(45.45)	57(47.11)
	Cantabria	78(54.55)	64(52.89)
Age (mean(sd))		22.13(2.68)	21.97(2.37)
Completion time in seconds (mean(sd))		985.01(431.28)	967.46(407.89)

Table 2. Sample characteristics.

Statement	F1	F2	F3
1. Patients should have the right to refuse life-extending treatments if they choose.	3	3	**3***
2. At the end of their life, patients should be cared for at home with a better quality of life rather than have aggressive and expensive treatments that will only extend life for a short period of time.	1	**0***	1
3. If somebody wants to keep fighting until the last possible moment, they should be allowed to do so, regardless of cost.	2	2	**-1***
4. It is important to give a dying person and their family time to prepare for their death, put their affairs in order, make peace and say goodbyes	2	2	2
5. I would place more value on end-of-life treatments than many medical treatments for non-terminal conditions.	**0***	-1	**-2***
6. Expensive drugs for people who are terminally ill and won't benefit very much are not a good use of public funding.	-2	-1	**0***
7. It is human nature to want to preserve life and go on living for as long as we can - it is one of our most basic instincts	**-1***	**2***	1
8. If a life-extending treatment for terminally ill patients is expensive, but the only treatment available, it should still be provided	1	1	**0***
9. It may not sound like much, but a few extra weeks or months might mean an awful lot to a family affected by a terminal illness	2	**3***	2
10. Life should only be extended if the patient's quality of life during that time will be good.	1	**0***	2
11. Real help and compassion should be about providing a death with dignity instead of more drugs to get a few more weeks or months out of a very sick body.	2	**0***	2
12. A year of life is of equal value for everyone.	-2	-1	**-3***
13. We should spend proportionately more on patients when we feel those patients have not had their fair innings - in terms of the length of their life or the quality of that life.	1	1	**0***
14. To extend life in a way that is beneficial to the patient is morally the right thing to do.	-1	**0***	-2
15. If the means of helping someone live longer exists, it is morally wrong to deny them the treatment.	0	**2***	-1
16. Not giving access to life-extending medicine to a person with a terminal illness is the same as killing them.	-1	**0***	**-2***
17. Treatments that are very costly in relation to their health benefits should be withheld.	-2	-2	-1
18. End-of-life drugs are not a cure, they are life-prolonging. There is no point in delaying the inevitable for a short time.	-1	**-2***	-1
19. Patients at the end of life will grasp any slightest hope but that is not a good reason for the NHS to provide costly treatments that may extend life by a short time.	-1	**-2***	**1***
20. Treatments that provide a short life extension are not worth it - they are only prolonging the pain for the patient's family/friends.	0	**-3***	-1
21. Extending life for people with terminal illnesses is only postponing death.	**0***	**-3***	-2
22. Life is sacred and if it is possible to preserve life, every effort should be made to do so.	-3	**0***	-3
23. I wouldn't want my life to be extended just for the sake of it - just keeping breathing is not life.	3	1	3
24. Everyone has a right to basic healthcare but there has to be limits and expensive, end-of-life, drugs are not basic care.	**-3***	-1	**0***
25. It's important to provide life-extending treatments to give a dying person time to reach a significant milestone, like a family event or a personal achievement.	0	**1***	1
26. I think life-extending treatments for people who are terminally ill are of less value as people get older.	-2	-2	**0***
27. Treating people at the end of life is not going to result in big health gains but the health system should be about looking after those patients in greatest need.	0	1	**0***
28. An objective measure of health expenditure control could be to legalize the euthanasia process.	1	**-1***	1

Table 3. Factor scores per statements.

-3	-2	-1	0	1	2	3
✳✳◄ 24. Everyone has a right to basic healthcare but there has to be limits and expensive, end-of-life, drugs are not basic care.	✳✳ 12. A year of life is of equal value for everyone.	✳✳ 16. Not giving access to life-extending medicine to a person with a terminal illness is the same as killing them.	27. Treating people at the end of life is not going to result in big health gains but the health system should be about looking after those patients in greatest need.	10. Life should only be extended if the patient's quality of life during that time will be good.	3. If somebody wants to keep fighting until the last possible moment, they should be allowed to do so, regardless of cost.	1. Patients should have the right to refuse life-extending treatments if they choose.
22. Life is sacred and if it is possible to preserve life, every effort should be made to do so.	26. I think life-extending treatments for people who are terminally ill are of less value as people get older.	18. End-of-life drugs are not a cure, they are life-prolonging. There is no point in delaying the inevitable for a short time.	25. It's important to provide life-extending treatments to give a dying person time to reach a significant milestone, like a family event or a personal achievement.	13. We should spend proportionately more on patients when we feel those patients have not had their fair innings - in terms of the length of their life or the quality of that life.	☐ 4. It is important to give a dying person and their family time to prepare for their death, put their affairs in order, make peace and say goodbyes	23. I wouldn't want my life to be extended just for the sake of it - just keeping breathing is not life.
	6. Expensive drugs for people who are terminally ill and won't benefit very much are not a good use of public funding.	14. To extend life in a way that is beneficial to the patient is morally the right thing to do.	✳✳► 21. Extending life for people with terminal illnesses is only postponing death.	2. At the end of their life, patients should be cared for at home with a better quality of life rather than have aggressive and expensive treatments that will only extend life for a short period of time.	9. It may not sound like much, but a few extra weeks or months might mean an awful lot to a family affected by a terminal illness	
	17. Treatments that are very costly in relation to their health benefits should be withheld.	✳✳◄ 7. It is human nature to want to preserve life and go on living for as long as we can - it is one of our most basic instincts	✳✳► 5. I would place more value on end-of-life treatments than many medical treatments for non-terminal conditions.	28. An objective measure of health expenditure control could be to legalize the euthanasia process.	11. Real help and compassion should be about providing a death with dignity instead of more drugs to get a few more weeks or months out of a very sick body.	
		✳✳ 19. Patients at the end of life will grasp any slightest hope but that is not a good reason for the NHS to provide costly treatments that may extend life by a short time.	15. If the means of helping someone live longer exists, it is morally wrong to deny them the treatment.	8. If a life-extending treatment for terminally ill patients is expensive, but the only treatment available, it should still be provided		
			20. Treatments that provide a short life extension are not worth it - they are only prolonging the pain for the patient's family/friends.			

Legend

✳ Distinguishing statement at P< 0.05
✳✳ Distinguishing statement at P< 0.01
► z-Score for the statement is higher than in all other factors
◄ z-Score for the statement is lower than in all other factors
☐ Consensus statement

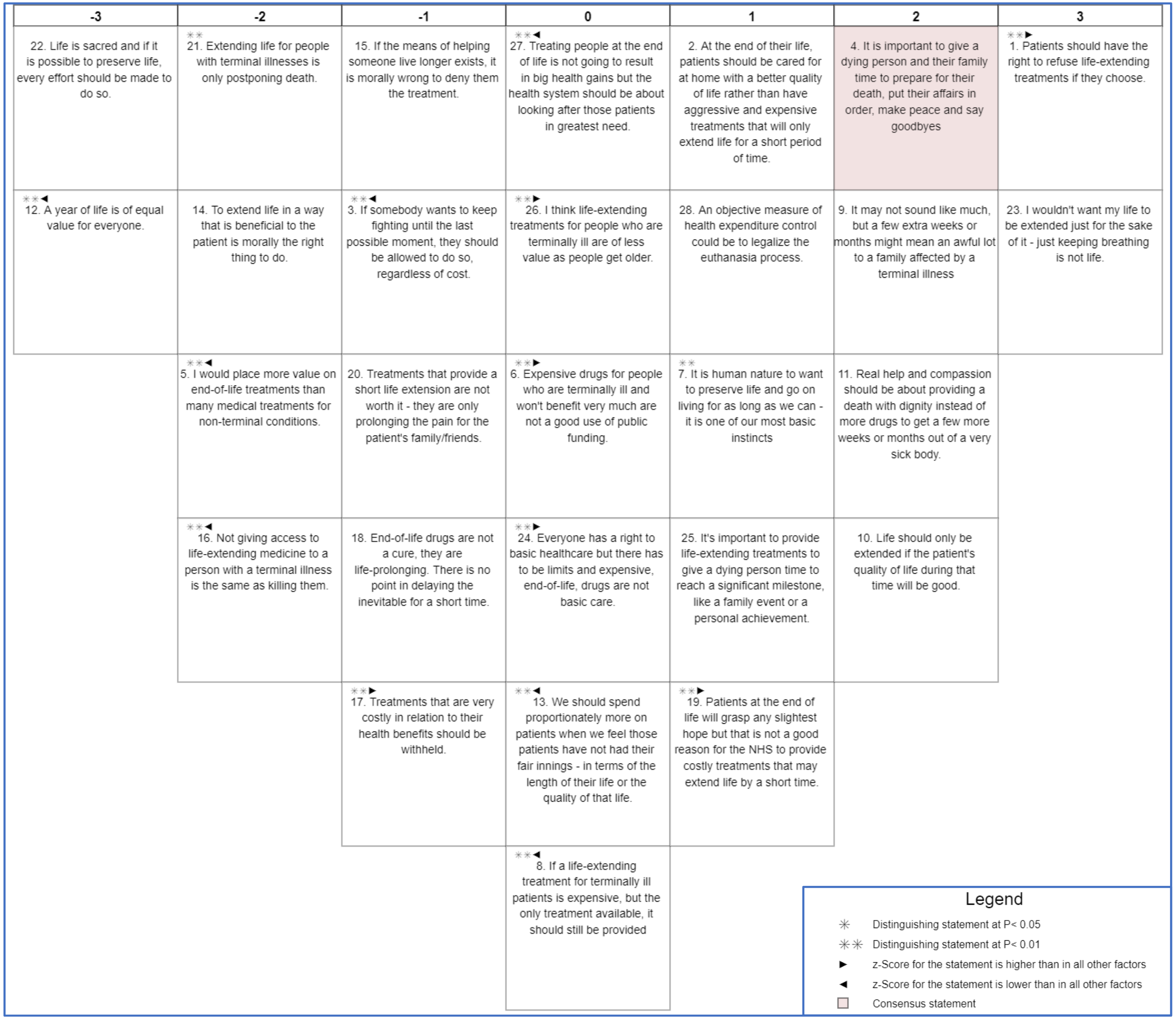
Figure 2. Composite Q-sort for Factor 1.

-3	-2	-1	0	1	2	3
✳✳◀ 21. Extending life for people with terminal illnesses is only postponing death.	17. Treatments that are very costly in relation to their health benefits should be withheld.	✳✳◀ 28. An objective measure of health expenditure control could be to legalize the euthanasia process.	✳✳▶ 22. Life is sacred and if it is possible to preserve life, every effort should be made to do so.	✳▶ 25. It's important to provide life-extending treatments to give a dying person time to reach a significant milestone, like a family event or a personal achievement.	✳✳▶ 15. If the means of helping someone live longer exists, it is morally wrong to deny them the treatment.	1. Patients should have the right to refuse life-extending treatments if they choose.
✳✳◀ 20. Treatments that provide a short life extension are not worth it - they are only prolonging the pain for the patient's family/friends.	26. I think life-extending treatments for people who are terminally ill are of less value as people get older.	✳✳ 24. Everyone has a right to basic healthcare but there has to be limits and expensive, end-of-life, drugs are not basic care.	✳✳◀ 2. At the end of their life, patients should be cared for at home with a better quality of life rather than have aggressive and expensive treatments that will only extend life for a short period of time.	13. We should spend proportionately more on patients when we feel those patients have not had their fair innings - in terms of the length of their life or the quality of that life.	3. If somebody wants to keep fighting until the last possible moment, they should be allowed to do so, regardless of cost.	✳✳▶ 9. It may not sound like much, but a few extra weeks or months might mean an awful lot to a family affected by a terminal illness
	✳✳◀ 18. End-of-life drugs are not a cure, they are life-prolonging. There is no point in delaying the inevitable for a short time.	✳✳▶ 12. A year of life is of equal value for everyone.	✳✳▶ 14. To extend life in a way that is beneficial to the patient is morally the right thing to do.	8. If a life-extending treatment for terminally ill patients is expensive, but the only treatment available, it should still be provided	4. It is important to give a dying person and their family time to prepare for their death, put their affairs in order, make peace and say goodbyes	
	✳✳◀ 19. Patients at the end of life will grasp any slightest hope but that is not a good reason for the NHS to provide costly treatments that may extend life by a short time.	✳✳ 5. I would place more value on end-of-life treatments than many medical treatments for non-terminal conditions.	✳✳◀ 11. Real help and compassion should be about providing a death with dignity instead of more drugs to get a few more weeks or months out of a very sick body.	✳✳◀ 23. I wouldn't want my life to be extended just for the sake of it - just keeping breathing is not life.	✳✳▶ 7. It is human nature to want to preserve life and go on living for as long as we can - it is one of our most basic instincts	
		6. Expensive drugs for people who are terminally ill and won't benefit very much are not a good use of public funding.	✳✳◀ 10. Life should only be extended if the patient's quality of life during that time will be good.	27. Treating people at the end of life is not going to result in big health gains but the health system should be about looking after those patients in greatest need.		
			✳✳▶ 16. Not giving access to life-extending medicine to a person with a terminal illness is the same as killing them.			

Legend

✳ Distinguishing statement at P< 0.05
✳✳ Distinguishing statement at P< 0.01
▶ z-Score for the statement is higher than in all other factors
◀ z-Score for the statement is lower than in all other factors
☐ Consensus statement

Figure 3. Composite Q-sort for Factor 2.



-3	-2	-1	0	1	2	3
22. Life is sacred and if it is possible to preserve life, every effort should be made to do so.	✳✳ 21. Extending life for people with terminal illnesses is only postponing death.	15. If the means of helping someone live longer exists, it is morally wrong to deny them the treatment.	✳✳◀ 27. Treating people at the end of life is not going to result in big health gains but the health system should be about looking after those patients in greatest need.	2. At the end of their life, patients should be cared for at home with a better quality of life rather than have aggressive and expensive treatments that will only extend life for a short period of time.	4. It is important to give a dying person and their family time to prepare for their death, put their affairs in order, make peace and say goodbyes	✳✳▶ 1. Patients should have the right to refuse life-extending treatments if they choose.
✳✳◀ 12. A year of life is of equal value for everyone.	14. To extend life in a way that is beneficial to the patient is morally the right thing to do.	✳✳◀ 3. If somebody wants to keep fighting until the last possible moment, they should be allowed to do so, regardless of cost.	✳✳▶ 26. I think life-extending treatments for people who are terminally ill are of less value as people get older.	28. An objective measure of health expenditure control could be to legalize the euthanasia process.	9. It may not sound like much, but a few extra weeks or months might mean an awful lot to a family affected by a terminal illness	23. I wouldn't want my life to be extended just for the sake of it - just keeping breathing is not life.
	✳✳◀ 5. I would place more value on end-of-life treatments than many medical treatments for non-terminal conditions.	20. Treatments that provide a short life extension are not worth it - they are only prolonging the pain for the patient's family/friends.	✳✳▶ 6. Expensive drugs for people who are terminally ill and won't benefit very much are not a good use of public funding.	✳✳ 7. It is human nature to want to preserve life and go on living for as long as we can - it is one of our most basic instincts	11. Real help and compassion should be about providing a death with dignity instead of more drugs to get a few more weeks or months out of a very sick body.	
	✳✳◀ 16. Not giving access to life-extending medicine to a person with a terminal illness is the same as killing them.	18. End-of-life drugs are not a cure, they are life-prolonging. There is no point in delaying the inevitable for a short time.	✳✳▶ 24. Everyone has a right to basic healthcare but there has to be limits and expensive, end-of-life, drugs are not basic care.	25. It's important to provide life-extending treatments to give a dying person time to reach a significant milestone, like a family event or a personal achievement.	10. Life should only be extended if the patient's quality of life during that time will be good.	
		✳✳▶ 17. Treatments that are very costly in relation to their health benefits should be withheld.	✳✳◀ 13. We should spend proportionately more on patients when we feel those patients have not had their fair innings - in terms of the length of their life or the quality of that life.	✳✳▶ 19. Patients at the end of life will grasp any slightest hope but that is not a good reason for the NHS to provide costly treatments that may extend life by a short time.		
			✳✳◀ 8. If a life-extending treatment for terminally ill patients is expensive, but the only treatment available, it should still be provided			

Legend

✳	Distinguishing statement at P< 0.05
✳✳	Distinguishing statement at P< 0.01
▶	z-Score for the statement is higher than in all other factors
◀	z-Score for the statement is lower than in all other factors
☐	Consensus statement

Figure 4. Composite Q-sort for Factor 3.

		Profile			
Variable	**Category**	**Extending life – patient's will and quality of life N(%)**	**Extending life – at all costs N(%)**	**Extending life – health equity, no special patients N(%)**	**P-value**
Year of studies	First to third-grade students	9(24.32)	15(40.54)	13(35.14)	0,258
	Fourth to fifth-grade students	7(18.42)	16(42.11)	15(39.47)	
	Sixth-grade students	9(19.57)	11(23.91)	26(56.52)	
Average grade	5-<7	5(15.63)	13(40.63)	14(43.75)	0,444
	7-8	14(25.00)	19(33.93)	23(41.07)	
	>8	4(16.00)	6(24.00)	15(60.00)	
Previous contact with terminally ill patients in clinical clerkship	No (none or scarce)	14(17.50)	28(35.00)	38(47.50)	0,634
	Yes (some or frequent)	7(25.00)	10(35.71)	11(39.29)	
Lives with family	No	12(19.35)	25(40.32)	25(40.32)	0,409
	Yes	13(22.03)	17(28.81)	29(49.15)	
Both parents with university studies	No	12(18.46)	20(30.77)	33(50.77)	0,342
	Yes	13(23.21)	22(39.29)	21(37.50)	
Religious beliefs	No	22(27.50)	22(27.50)	36(45.00)	0,012
	Yes	3(7.32)	20(48.78)	18(43.90)	
Influence of religious beliefs in ethical principles	Never/Scarce/No/Not applicable/	24(24.74)	26(26.80)	47(48.45)	0,001
	Yes/Sometimes/Always	1(4.17)	16(66.67)	7(29.17)	
Influence of personal experience with terminal patient in EoL care opinion	Never/Not applicable	12(17.91)	20(29.85)	35(52.24)	0,064
	Sometimes	5(15.63)	12(37.50)	15(46.88)	
	Always	8(36.36)	10(45.45)	4(18.18)	
Gender	Male	8(20.51)	13(33.33)	18(46.15)	0,969
	Female	17(20.73)	29(35.37)	36(43.90)	
Age (mean(sd))		22.42(3.74)	21.77(2.15)	21.91(1.67)	0,565

Table 4. Respondents' characteristics associated with the profiles. (EoL: end-of-life)