

# Knowledge in Pain and Palliative Care in Medical Students From 2 Universities in Mozambique: A Cross Sectional Study

Emília Pinto (✉ [emiquidade@gmail.com](mailto:emiquidade@gmail.com))

Faculty of Medicine, Porto University <https://orcid.org/0000-0001-8286-9014>

**Teresa Schwalbach**

Universidade Eduardo Mondlane Faculdade de Medicina

**Ferraz Gonçalves**

Instituto Portugues de Oncologia do Porto Francisco Gentil EPE

**Jahit Sacarlal**

Universidade Eduardo Mondlane Faculdade de Medicina

**Luisa Castro**

Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciencia Center for Research in Advanced Computing Systems

**Guilhermina Rego**

Universidade do Porto Faculdade de Medicina

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## Research article

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# Abstract

**Background:** Palliative Care (PC) needs have been increasing in low- and middle-income countries. The education of its contents avoids the patients and families' suffering and therapeutic futility.

**Aim:** to assess the pain and palliative care's knowledge in Mozambican medical students of the fifth and sixth years.

**Methods:** A cross-sectional study was conducted between August 2018 and July 2019. Data was collected by applying a self-administered survey directed to students from 2 medical schools in Mozambique. Comparison of answer's frequencies between hospitals was performed using chi-square and Fisher's exact test.

**Results:** From the 146 participants, 52.7% were female and the median age was 24 years old. Regarding general knowledge: 90.1% think they need to improve their knowledge on pain management, 50.3% of the participants did not know the palliative care World Health Organization's (WHO) definition. Concerning to therapeutic approach, 36.4% did not have knowledge in control of symptoms, 43.7% did not know the WHO pain management scale, 65.3% did not know how to initiate analgesia for cancer pain. There are significant differences between universities in training related to medical posture on communication to bad news to patients and family as well as training in terminally ill patients.

**Conclusion:** Results show that students from these 2 medical schools have gaps in pain and palliative care knowledge. There is a need to introduce palliative care education in medical training in Mozambique.

## Background

According to the WHO, "PC is an integral approach that promotes the quality of life of patients and their families, who face diseases that threaten the continuity of life, through the prevention and relief of suffering. It requires early identification, correct assessment and appropriate treatment for pain relief and other physical, psychosocial and spiritual problems," from the diagnosis of an incurable disease to the period of mourning of the family (1).

Any future practice by health professionals is based on their knowledge during training. The provision of health care that involves, among other aspects, the diagnosis, the disclosure of bad news, the therapeutic approach and its limitation and / or when to limit it, and the involvement of the patient and family in the therapeutic decision, the multi, and interprofessionals relations, communication with patients, caregivers, and / or family members, the provision of end-of-life care and facing death as a natural process of life must be integrated into the implementation of medical education and other health professionals. And the lack of this preparation leads to fears, uncertainties, doubts and even suffering from these professionals.

Access to health care is a major challenge in Low- and Middle-Income Countries (LMICs). PC remains limited, inaccessible or even absent in these countries and its availability is an urgency. The difficult

access, lack of specialized professionals, the late detention of some pathologies and the inaccessible and / or insufficient treatment options contribute to high mortality rates (2). Although not established as a medical specialty in Mozambique, since 2012 there has been a National Palliative Care Policy, a training curriculum and a reference manual, which provides for the implementation of this care at all levels and for the whole society (3).

PC should be introduced as soon as possible in patients with severe disease, following an early guidance for symptom's control, with the aim of improving their quality of life, satisfaction for caregivers and reducing costs related to the patients' hospitalization (4, 5).

In 2014, the World Health Assembly Resolution on PC called for all countries to incorporate the provision of PC into their national health system in order to guarantee their access to all who need it, but the intended results have not been achieved (1).

The lack of PC education in the undergraduate medical curricula is considered as one of the most important barriers in the integration of PC in the health care systems em Africa (2).

The purpose of this study is to assess the level of knowledge on pain and palliative care in Mozambican medical students of the fifth and sixth years and their personal attitudes towards it.

## Methods

A cross-sectional study was carried out between August 2018 and July 2019 on students in the 2 main hospitals in Mozambique, namely Maputo Central Hospital (MCH) and Nampula Central Hospital (NCH), associated with Eduardo Mondlane University (EMU) and Unilúrio University, respectively.

Data was collected by applying an anonymous questionnaire directed to all students of 5th and 6th years from the 2 medical schools with practices in these hospitals, present during the study period until the sample was complete. The applied survey with 19 questions with multiple choice response (yes/no) that include general knowledge (Q1-Q10), attitudes and practices in pain and palliative care's therapeutic (Q11-Q19) was based on a validated form used in Colombia and Brazil (6, 7) and culturally adapted to Mozambican Portuguese. Minimum sample size was calculated for proportions based on the students' global number in the 2 medical schools, using a 95% confidence interval, an error margin of 5%, generating a minimum sample size of 142 from a population of 277 students.

All the information collected was entered and analyzed with SPSS software (v. 25). Descriptive statistics were used as appropriate: absolute and relative frequencies, n (%), for categorical variables and medians with interquartile intervals, med [IQR], for quantitative variable age which distribution deviated significantly from normality. Comparison of survey answer's frequencies between hospitals was performed using chi-square and Fisher's exact test. P-values were considered significant if less or equal to 0.05.

The study was approved by the Institutional Committee of Bioethics for Health of the Faculty of Medicine & Maputo Central Hospital (CIBS FM&HCM/08/2018) and by the Bioethics Committee of the Faculty of

Medicine of the University of Porto. Permission was also obtained from hospitals selected for data collection.

## Results

### 1. Students' demographic and professional characteristics

A total of 146 students participated in the study, with a median age of 24 years old, 52.7% were female and 67.1% were from the Eduardo Mondlane University (see Table 1).

### 2. Participants' general knowledge

Regarding the participants' general knowledge, 34% of the participants reported not having received sufficient training in patients' pain management however, 93% revealed that in their medical school there was no specific discipline on pain. About 69% of the students referred, they did not receive sufficient training in terminally ill's care, mostly at Eduardo Mondlane University (72%). Half of the participants (50%) did not know the palliative care WHO's definition, with significant difference between the two universities ( $p=0.009$ ). Most of the students (90%) referred to know some pain assessment's scale however, only 59% used it in practice. Thirty-six percent of the students revealed that they did not receive enough information about the control of common symptoms in palliative care, like dyspnea, vomiting, constipation and cachexia. More than half of the participants (54%) said that they did not learn communication tools and medical posture to give bad news to patients and family members during training, and most of them (90%) considered that it is necessary to improve their knowledge patients pain's treatment. There was a significant difference in knowledge about neuropathic pain and nociceptive pain, only 10% of students at EMU did not know its difference against 29% from Unilúrio ( $p = 0.004$ , see Table 2).

### 3. Attitudes and practices in Pain and Palliative Care's therapeutics

More than half of the participants (56%), reported knowing the WHO's scale for pain management, mainly from the Eduardo Mondlane University. There were no significant differences in the 8 remaining responses related to the therapeutic attitude in these 2 Universities: 65% of the participants did not feel safe to start cancer pain's analgesia, 52% did not know which medication and dosage to start opioid's treatment. Near 86% of the participants did not know the equivalence for opioid's rotation, 71% referred not feeling comfortable handling them, and 69% agreed their greatest fear in prescribing them is respiratory depression. In relation to adjuvants, more than 76% stated to know the antidepressants and anticonvulsants mechanism of action (see Table 3).

## Discussion

### *Palliative Care Knowledge and Curriculum*

In 2004, WHO recommended that governments include PC in training curricula for health workers at all levels (8).

The provision of PC should not be performed only by specialized professionals, however, there are palliative actions, also known as general or primary PC, which are composed of therapeutic measures without curative intent, practiced by professionals without specific preparation, as a way to minimize the negative repercussions' effects of the disease on the patient's well-being (9).

Although it is a recognized medical specialty, PC curriculum has not been introduced in the pre-graduation of different medical schools or, where it was introduced, it does not provide enough tools to support future PC practices (10).

In this study, only 2 of the 6 medical schools in Mozambique were interviewed, however, in all of them the subject of PC is not part of the curriculum. We studied only 2 medical schools in much deeper issues related to the discipline of pain and palliative care. Some of them address some aspects of pain in the Pharmacology discipline, however, there is no specific discipline on it.

In a study carried out in Colombia, it was found that more than 70% of students did not have a discipline related to pain and PC in their medical schools, and in Brazil 81% of the medical school taught these disciplines (6, 7). In the same study, more than 50% of participants in Mozambique and Brazil (47%) did not know the definition of the World Health Organization for Palliative Care (6, 7).

Knowledge of the concept of PC and the principles that govern it are important in clinical practice because most of the therapeutic decisions and guidance of patients, need these knowledges and consequently less suffering of the patient with futile treatment.

In África, five countries have PC integrated in the curriculum of health professionals, and only Uganda and South Africa have recognized palliative care as an examinable subject (11).

Studies from different countries have reported that medical students from United States (12), Brazil (13), Germany (14) and Turkey (15) have gaps in education and PC training (16, 17) and reported uncertain providing it (18).

Palliative medicine was recognized in 2013 as a formal discipline in Israel, however, students felt that the training curriculum should address more practical approach and applicable skills rather than a theoretical one (19).

The universities take the responsibility on integrating and training in PC into undergraduate and postgraduate education. PC has been included in the undergraduate curriculum in Uganda and South Africa and countries as Namibia, Botswana, Malawi, Tanzania and Kenya are in a process for its implementation, however each country is doing it at a different level of integration. The first postgraduate PC diploma and degree in the region was developed in 2001, at the University of Cape Town, and PC

certificate courses occurs in Uganda, South Africa, Kenya, Zambia, Swaziland, and Botswana amongst others (11).

### **Symptom's control and treatment**

The introduction of theoretical contents into the university curriculum and the consolidation of student theory and practice may be crucial for better symptomatic patients' control and end-of-life issues. The overload of physical and psychological symptoms is similar in chronic terminal cancer and non-cancer patients, so the approach to undergraduate education should be prioritized (20). Despite PC being transversal, it is for cancer where they are mostly studied and applied because it was in oncologic patients that most scientific evidence in PC and most interventions were developed (21).

The "unrelieved pain" only reduces through multi and interdisciplinary action by the PC team. The lack of trained professionals and the growing trend of the prevalence of cancer and cancer pain are imperative factors for the education of health professionals pain management and other symptoms (22).

Thirty-six percent of the students in these 2 universities in Mozambique, and 81% of medical students in Brazil (7) believed that during their training they did not receive enough information on controlling the most common symptoms as dyspnea, vomiting, constipation and cachexia in palliative care's patients.

Students from others studies lack PC's knowledge, especially on the pain and symptom control aspects (14). However, an integrated PC curriculum leads to improved knowledge (23) and physicians with palliative medicine education make less aggressive decisions in end-of-life care, as to withdraw life-prolonging therapies (24).

Like Mozambique, students from Colombia (70%) and Brazil (77%) reported that they did not receive enough information to manage pain's patients during training (6, 7).

Pain is one of the most frequent and serious symptoms experienced by patients in PC's needs. Opioid analgesics are essential for treating the pain associated with many advanced progressive conditions. For example, 80% of patients with AIDS or cancer, and 67% of patients with cardiovascular disease or chronic obstructive pulmonary disease will experience moderate to severe pain at the end of their lives. Opioids can also alleviate other common distressing physical symptoms including breathlessness. Controlling such symptoms at an early stage is an ethical duty to relieve suffering and to respect the dignity of people (1).

More than half of students in Mozambique do not know the World Health Organization's "ladder" for pain management, more than revealed in Brazilian students (19%). Similar to studies carried out in Brazil (79%) and Colombia (78%), most Mozambican students would not feel safe to approach cancer patients. They do not know with which medication and dosage starts opioids' treatment (Brazil 77% and Colombia 53%). Worst results was found in the question "knowledge regarding the equivalences in opioid rotation" where less than 15% in Mozambique and Brazil knew that (6, 7).

In a questionnaire comprising 21 questions exploring the students' knowledge in PC with 222 Dutch medical universities, 69.4% filled in this part of the questionnaire. Near 50% answered more than half of the questions correctly and most of them was in the domains of pain knowledge, psychosocial knowledge, and non-pain symptom control knowledge. The question answered correctly most often was on communicating the prognosis and the question answered correctly least often was on the side effects of opioids (25).

As Mozambique, most medical students in Colombia (68%) and half in Brazil (51%) students revealed that the greatest fear of opioid prescription is respiratory depression, and chemical depression 73% in Colombia, and 34% Brazil (6, 7).

### ***Death and end-of-life issues***

It is important to educate physicians regarding PC and to emphasize end-of-life (EoL) issues, particularly during the last years of medical training and in the beginning of his professional activity (26) .

Integration of theoretical knowledge with practical skills is required in PC: ranging from diagnosis, to delivery of bad news, to discussions of treatments and end-of-life issues (27). Health professionals from diverse specialties and services, are essential in the pc provision from diagnosis to death and mourning (28).

In these 2 universities in Mozambique more than half of the students revealed that they did not learn during their training communication tools and medical posture to give bad news to patients and family members. The same result was found in Brazil (7).

This training can help medical students to be more aware of palliative issues, to face their own fears about death and its process and to establish a positive attitude towards this reality. In addition, it can help them to integrate PC into their future work and to approach them with a sense of competence and tolerance, leading to better interactions with end-of-life patients and their families or caregivers (29). In a study carried out in Carapicuíba\_Brazil, health professionals were interviewed and they expressed insecurity dealing with issues related to death. Faced with end-of-life issues, these professionals were powerless, suffering, and sometimes fearful when faced with these situations. One of the main reasons pointed out has been the lack of training and they were unanimous in pointing out that the teaching model implemented by the majority of medical schools focuses on preserving life instead of providing quality care and is illness-oriented, disregarding the individuality of the human being. And this training gap has negative consequences for the patient-physician and family-physician relationship (30).

Medical students from Mozambique (69%) and Brazil (90%) did not receive enough information during training on the care of terminally ill patients (7).

Students in Germany reported only limited confidence in knowledge about PC, and were not confident in communicating the change from curative treatment to PC as well as in the provision of care for terminally ill patients (31).

The focus of medical schools has mainly been on curative care, with limited emphasis on issues of dying and death (26). However, limiting discussions about death during clinical training at university can difficult the medical daily practice in the future. Some studies reveled that health professionals were uncomfortable when talking about death and dying and this may reflects a lack of preparation for coping with death. This study also emphasizes the need to maintain with death and EoL training to be present even in continued medical education process (32, 33).

PC limits the physical and emotional suffering of patients and family members, however, its approach at the end of life is a psychological challenge for health professionals. Health education and training in health students can support them in this transition, helping them to deal with it. Many health professionals and students report being unprepared to deal with care at the end of life (34).

### ***When and how to introduce pre-graduate education in Palliative Care?***

In a meta-analysis that evaluated when to introduce the PC curriculum, it was defended that it must be articulated with the years of the program. The timing of the intervention varied but it tended to be in the third year of the students' course. Some of them did not specify a year level (35) found that there was no need to introduce palliative care in the first preclinical years.

The effectiveness of the e-learning education system has not been proven in the approach to obtain practical competence. There is a need to maintain a real-life contact with patients and their families to acquire these skills and, consequently, increase self-esteem of communication competence with dying patients and their families, the self-esteem of knowledge and skills in palliative care and preparation to provide more appropriate PC (36).

Students ask for instruction and training regarding attitudes toward death and dying through experience-based teaching (37). Education is effective in improving students' knowledge and attitudes towards PC, however, some studies highlight the need for more high-quality, long-term trials on the effect of PC education to determine the most effective model of PC's curriculum (19).

Undergraduate medical education must be transformed to help students make the transition of a cure for a care approach and, this teaching must involve not only teaching material, but also teaching strategies and methods, interprofessional education focusing on psychosocial aspects and EoL care (38).

Knowledge of the concept of palliative care and the principles that govern it are important in clinical practice because most of the therapeutic decisions and guidance of patients, passes through the notion of this knowledge and consequently less suffering of the patient with futile treatment.

### **Limitations**

Only two of the six medical schools in Mozambique were surveyed, and some universities had different curricula, so the results of this survey may not be generalizable to the whole country.

# Conclusion

At Eduardo Mondlane University and Unilúrio University in Mozambique, medical training does not include CP in the curriculum. Most students reported difficulties in dealing with issues related to pain's control and its treatment as well as in another PC symptom's control and EoL issues. All these findings of the study in addressing pain and PC's knowledge, are similar to most countries where there are gaps due to the lack of a specific curriculum on medical students addressing pain and PC as well as practises issues related to end-of-life. And almost all students were unanimous in saying that it is necessary to improve their knowledge in the treatment of pain patients. The inclusion of PC as a mandatory content during pre-graduate training, remains an urgent and unmet need. Future studies with larger samples and objective measures should further evaluate training programs for understand and establish an appropriate curriculum.

# Abbreviations

EMU: Eduardo Mondlane University

EoL: End o Life

MCH: Maputo Central Hospital

PC: Palliative Care

WHO: World Health Organization

# Declarations

## Recommendations:

1. There is an urgent need to introduce palliative care curricula in the medical schools in Mozambique,
2. Theoretical and practical training must be in accordance with the reality of the country validating cultural issues, access and availability of essencial medicines,
3. A multicenter study with sequential assessment of a larger group of patients in a longitudinal design will generate a more generalizable data.

## Ethics and consent to participate

All the objectives of the study were explained and delivered in information paper, and then a signed written consent was requested. Completing the questionnaire respected the anonymity and privacy of each participant.

The study was approved by the Institutional Committee of Bioethics for Health of the Faculty of Medicine & Maputo Central Hospital with number CIBS FM&HCM/08/2018 and by the Bioethics Committee of the

**Availability of data and materials (not applicable).**

**Competing of interest:** One of the authors (Professor Jahit Sacarlal) was a member of the ethics committee, but he did not participate in the project's approval at the committee.

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**Authors' contributions.** **EP** designed, conduct the study, collected, analyzed and interpreted the data, wrote the manuscript. **TS** helped design the study, analyze the data, and write the manuscript. **FG** helped design the study, analyze the data, and write the manuscript. **JS** helped design the study, analyze the data, and write the manuscript. **LC** helped design the study, performed statistical analysis, interpreted data and was a major contributor in writing the manuscript. **GR** helped design the study, analyze the data, and write the manuscript. All authors read and approved the final manuscript.

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## Tables

**Table 1. Students' demographic characteristics (N=146).**

| Variables                   | Description |
|-----------------------------|-------------|
| Age in years, med [IQI]     | 24 [23-26]  |
| Medical schools, n (%)      |             |
| Unilurio University         | 48 (32.9)   |
| Eduardo Mondlane University | 98 (67.1)   |
| Sex, n (%)                  |             |
| Female                      | 77 (52.7)   |
| Male                        | 69 (47.3)   |
| Frequency year*, n (%)      |             |
| 5th year                    | 58 (40.0)   |
| 6th year                    | 87 (60.0)   |

\*Only 145 students provide information

**Table 2. Pain and palliative care's knowledge by Medical School, in frequencies of "yes" answers for Q1 – Q10.**

| Q1-Q10 questions   | E.Mondlane University (n=98), n (%) | Unilurio University (n=48), n (%) | p-value                       |
|--|-------------------------------------|-----------------------------------|-------------------------------|
| Q1. Do you believe that during your training you received enough information to manage pain patients? (N=145)  | 62 (63.9)                           | 33 (68.8)                         | 0.565 <sub>a</sub>            |
| Q2. Is there a specific pain discipline in your faculty? (N=146)   | 10 (10.2)                           | 0 (0.0)                           | <b>0.031</b> <sub>b</sub>     |
| Q3. Do you believe that during the training you received enough information about the care of terminally ill patients? (N=145)   | 27 (27.8)                           | 18 (37.5)                         | 0.236 <sub>a</sub>            |
| Q4. Do you know the WHO definition of palliative care? (N=145)   | 56 (57.1)                           | 16 (34.0)                         | <b>0.009</b> <sub>a</sub>     |
| Q5. Do you know the difference between neuropathic and nociceptive pain? (N=146)   | 88 (89.8)                           | 34 (70.8)                         | <b>0.004</b> <sub>a</sub>     |
| Q6. Do you know any pain assessment scale? (N=145)   | 92 (94.8)                           | 39 (81.3)                         | <b>0.015</b> <sub>b</sub>     |
| Q7. Do you always use scales to assess pain? (N=138)   | 66 (68.8)                           | 16 (38.1)                         | <b>0.001</b> <sub>a</sub>     |
| Q8. Do you believe that during your training you received enough information on controlling the most common symptoms (dyspnea vomiting constipation cachexia) in palliative care's patients? (N=143) | 54 (56.8)                           | 37 (77.1)                         | <b>0.017</b> <sub>a</sub>     |
| Q9. Did you learn during your training communication tools and medical posture to give bad news to patients and family members? (N=142)  | 32 (34.0)                           | 33 (68.8)                         | <b>&lt;0.001</b> <sub>a</sub> |
| Q10. Do you think it is necessary to improve your knowledge in the treatment of pain patients? (N=142)   | 85 (89.5)                           | 43 (91.5)                         | 1.000 <sub>b</sub>            |

Bold for significant differences:  $p < 0.05$ ; <sup>a</sup> Chi-square test; <sup>b</sup> Fisher exact test.

**Table 3. Pain and palliative care's therapeutic by medical school, in frequencies of "yes" answers for Q11 – Q19.**

| Q11-Q19 Questions  | E.Mondlane University (n=98), n (%) | Unilurio University (n=48), n (%) | Chi-square, p-value |
|--|-------------------------------------|-----------------------------------|---------------------|
| Q11 Do you know the WHO scale for pain management? (N=144)                                   | 64 (66.7)                           | 17 (35.4)                         | <b>&lt;0.001</b>    |
| Q12 if you see a patient with cancer pain you would feel safe to start the analgesia (N=144) | 34 (35.4)                           | 16 (33.3)                         | 0.804               |
| Q13. Do you know what medication and dosage to start opioid treatment with? (N=144)          | 47 (49.0)                           | 22 (45.8)                         | 0.723               |
| Q14 Do you know the equivalences for opioid rotation? (N=143)                                | 12 (12.5)                           | 8 (17.0)                          | 0.464               |
| Q15. Do you feel safe about opioid management? (N=143)                                       | 26 (27.4)                           | 15 (31.3)                         | 0.628               |
| Q16. Is Your biggest fear on prescribing opioids respiratory depression?(N=142)              | 68 (72.3)                           | 30 (62.5)                         | 0.230               |
| Q17.Is our biggest fear of prescribing opioids chemical depression?(N=143)                   | 50 (52.6)                           | 28 (58.3)                         | 0.518               |
| Q18. Do you know the mechanism of action of antidepressants in pain management (N=144)       | 77 (80.2)                           | 33 (68.8)                         | 0.127               |
| Q19. Do you know the mechanism of action of anticonvulsants in pain (N=144)                  | 53 (55.2)                           | 25 (52.1)                         | 0.723               |

Bold for significant differences:  $p < 0.05$ .

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Supplementarymaterial.docx](#)