

# Knowledge of Resident Doctors Regarding Palliative Care: A Systematic Review

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## Research

**Keywords:** Palliative care, terminally ill patients, end of life care, resident doctors, medical residency, knowledge, practices

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# Abstract

**Background:** Palliative care aims to improve life quality of patients and their families, preventing and relieving people's suffering in coping life-threatening diseases. Many challenges are linked to palliative care, such as the lack of specific disciplines in doctors training; the scarcity of services and specialized programs in palliative care in public and private health systems and the lack of training for resident doctors. **Objective:** To identify knowledge of resident doctors regarding palliative care. **Method:** A systematic review according to PRISMA (2009), with searches carried out in Cochrane Library, MEDLINE / PubMed, Scopus, Web of Science databases and gray literature of Brazilian Digital Library of Theses and Dissertations (BDTD), with the acceptance of articles in English, Portuguese and Spanish, without delimitation of publication date, geographic location and type of study. Only studies with resident doctors were included.

**Results:** During the search, 931 articles were found. Of these, 363 were discarded because they were duplicated and 568 were discarded after reading titles and abstracts, leaving 24 articles for complete reading, which after reading and consensus of the three researchers, only 07 of these articles were included in the comparative synthesis. Three intervention studies, two cross-sectional and two qualitative studies were found. In the observed data, all the analyzed studies had a sample of less than 100 subjects, with a total of 442 subjects, of which 137 (30.99%) were women and 111 (25.12%) men, with average age ranging from 26.6 to 32.1.

**Conclusions:** The studies analyzed in this review indicate that the knowledge of resident doctors was limited and insufficient related to palliative care, what indicates the need of greater investments in training, through teaching-learning methods based on rotation, simulation and others, thus improving not only knowledge, but also the practice in palliative care.

**PROSPERO record:** CRD42020159428

## Background

It is possible to observe that the living process has extended exponentially in the last decades, due to technological innovations that impacted the increase in survival. Despite the increase in cancer prevalence and several chronic diseases, it is clear that death, in most of cases, is no longer an episode, but a process, which is often extended, and may take years and even decades depending on the illness [1].

Every disease, especially the ones that threatens to interrupt life, can cause a series of losses, such as the loss of autonomy, self-image, security, physical capacity, respect, not to mention concrete material losses, such as employment, purchasing power and therefore the social status with which the patient and family are forced to live, almost always without being prepared for this situation. This event often causes anxiety, depression and hopelessness, interfering negatively in the evolution of the disease, in the intensity and frequency of symptoms, which can be difficult to control [2].

There is a daily increase in elderly patients' health services sent to special care. Especially people with dementia syndromes from the most diverse etiologies or even with severe neurological sequels. In this regard, the palliative care appears as an option, to fill this gap in the active care for patients in the last phases of life, in a more dignified way. A decent finitude can be defined as the one without pain and suffering, minimized with the palliative care suited to the patient's needs [3, 4].

The expressions "patient in the last phases of life" and "out of therapeutic possibilities" are the labels given to patients with diseases which doesn't have any possibility of cure. These are progressive diseases like degenerative neurological diseases, cancer and AIDS. The treatment of the patient in the last phases of life, no longer suggests a cure, but the relief of symptoms and the preservation of life [5].

Cicely Saunders who was a nurse, doctor and social worker, during the 1960s, made efforts to introduce the Hospices movement which were institutions designed to soften the pain caused by terminal illnesses, providing care for people to have the possibility of dying in peace, with dignity and with life quality through special care. This kind of care seeks for a whole

vision of the human being, through a multiprofessional team, compounded by doctors, nurses, psychologists, social workers, religious, volunteers and other professionals, when necessary. This movement represents the philosophy of palliative care [6].

The first palliative care unit was founded in 1960 in Korea, at the Calvary Hospice of Kangnung. In the 1970s, the concern about palliative care in some countries arises, what made some institutions emerge as the International Association for the Study of Pain and the Japanese Association for Clinical Research on Death and Dying. In the 1980s, the World Health Organization (WHO) inserted palliative care in its concepts and raised the need of a program as part of the approach to cancer patients. In the 1990s, the early introduction of palliative care in the course of oncological disease was recommended [7].

The first Palliative Care definition published by WHO, in 1990, was "Active and total care for patients whose disease is not responsive to healing treatment. The control of pain, other symptoms and psychosocial and spiritual problems is essential". This definition was revised in 2002, reaffirmed and replaced in 2017, as an approach that improves life quality of patients and their families, who face life-threatening diseases. Palliative care aims to prevent and relieve suffering through early identification, correct assessment and pain treatment, as well as other physical, psychological, socio-family and spiritual problems [8].

In Brazil, palliative care started in the 1980s, with the first services instituted in Rio Grande do Sul, São Paulo, Santa Catarina and Rio de Janeiro. It began with the creation of Cancer Hospital IV, from National Cancer Institute (NCI), which works since 1989 specifically for palliative care in outpatient care, hospitalization, in addition to home care. It is a national reference in health professional education and training for end-of-life care. In 2005, the National Academy of Palliative Care (NAPC) was founded by a group of doctors from different areas of activity, such as Geriatrics, Pediatrics, Oncology and Family Medicine, whose main objective is to disseminate, clarify and promote the palliative care in Brazil [9, 10].

In Brazil, there is a training center for palliative doctors in Santa Catarina, in which the medical clinic resident can choose to take the third year in palliative medicine. Other states are also already offering medical residency in palliative care such as Brasília, Rio de Janeiro and São Paulo [11]. The training in palliative medicine should develop in the professional the ability to communicate, teamwork, competence in decision-making in the face of the life-threatening illness, management of specific drugs, such as painkillers, intestinal regulators, sedatives and antipsychotics, as well as support techniques for coping with death and grief. It is also known that the professionals' lack of preparation to deal with death is caused by cultural and spiritual issues and the teaching in the health sector, which emphasizes technical-scientific training in detriment of the approach of emotional, spiritual and social aspects [12]. Often, death can be understood as defeat, a personal frustration that goes beyond technical limitations. Because of this perspective, death is seen as fearful and doctors try to avoid it at all costs, although throughout their medical residency they are trained to deal with it everyday and conflicting situations, in real and hidden curricular modality [13,14 ].

Human terminality process should not be a problem in medicine field, as it is a natural event, such as birth, growth and development. In this painful process of impossibility of cure, the patient needs love, understanding, solidarity and his dignity consideration. Therefore, it is necessary that medical education also makes professors and students aware about the humanization of people who are on the edge of life and death. Thus, it is necessary to introduce topics about death and the dying process, life finitude and palliative care, in the interdisciplinary doctors training and other professionals in the health areas [15, 16, 17].

In Brazil, the Medical graduation courses must follow the National Curriculum Guidelines (NCG) proposed by Education Ministry [18]. However, for the most medical residency programs, there are no proposed national program guidelines on palliative care, as well as requirements for evaluation processes for certification at the end of specialist training.

Palliative care's philosophy suggests that, when addressed during medical students' training, it can provide better therapeutic resources when a cure is possible and better resources for palliative care when a cure cannot take place [19]. It is necessary and important to include palliative care studies in medicine courses' programs, just as in all courses from health area and also

during professional practice, so patients can be attended in an ethical, holistic and human way, especially in the impossibility of the disease's cure.[20].

According to the National Association of Palliative Care (NAPC) [21], in Brazil, medical courses do not teach students how to deal with terminally ill patients, how to recognize symptoms or manage this situation in a humanized and active way. However, the doctor in palliative care is a very important professional. He will contribute in providing clarifications on diagnoses and prognosis for the patient whose death is certain, guiding the team, always cultivating a good communication with the other professionals, making decent the last moments of the patient's life.

It is essential to search for suitable knowledge so that a comprehensive care can be provided to the patient in the last phases of life. It is also important to expand the discussion and training on palliative care, improving medicine graduation courses programs and other health areas, with subjects that address death and care, as well as raising the awareness of the population itself, who knows little about the topic [22].

Based on studies already carried out on palliative care practices worldwide, and also, taking into account the medical skills (knowledge, practices and attitudes) that are necessary to improve the quality of survival of patients seeking a cure, this systematic review may serve as a dissemination and expansion tool to discuss palliative care, both in medicine and in area of health care.

There is an urgent need for studies that present and systematize palliative care at the medical residency, especially in the face of a worldwide scenario of increased life expectancy for the population and concern for the life quality of any patient, especially those in terminal condition. The role of the resident doctor, in this new context, is no longer just a curative, reduced to a limited vision of human health. In this way, the professional starts to perform a function that involves a humanized, systemic and biopsychosocial approach with terminal patients, meeting a broader, updated concept of health-disease and better suited to new educational needs.

Considering the relevance of the topic and the discussions in the scientific literature regarding care for terminally ill patients, this study has the following question as its guiding thread: What is the knowledge of the resident doctors in palliative care assistance?

### **General objective**

To identify knowledge of resident doctors regarding palliative care.

### **Specific objectives:**

- - To assess knowledge of resident doctors regarding palliative care;
- - To identify practices of resident doctors regarding palliative care;
- - To check if there are variations in knowledge and practices in palliative care in different medical specialties.

## **Method**

A systematic review, which protocol was published on the prospective international registration site for systematic reviews – PROSPERO (CRD42020159428).

Structured according to Preferred Reporting Items for Systematic Reviews and Meta-Analyzes guidelines - PRISMA (2009) [23], according to Additional file 1.

### **Eligibility criteria**

The studies were selected according to the criteria:

**Participants (Population):** Individuals of both sexes, any age and any geographical location.

**Exposure:** Any specialty and at any level of medical residency (R1, R2, R3 and R4).

**Comparison:** With or without a comparison group.

**Outcomes:** Knowledge level of resident doctors regarding palliative care.

**Study design:** All types of study; gray literature was considered (theses and dissertations) from any geographical location; in Portuguese, English and Spanish. Without delimitation of publication date. Editorials, letters and literature review articles were excluded.

### Research strategy

The search was made in the databases of Cochrane Library, MEDLINE / PubMed, Scopus, Web of Science and Brazilian Digital Library of Theses and Dissertations (BDTD) gray literature.

To guarantee the literature saturation, reference lists of included studies or relevant reviews identified through manual search were analyzed. A research for gray literature was also made.

The following keywords or descriptors were used in the research strategy: *“palliative care” OR “palliative medicine” OR “terminal patient” OR “end of life care” OR “terminal care” AND “resident doctors” OR “medical residency” OR “medical students” AND “knowledge” OR “practices”*.

The research was carried out according to the guidelines of each database, as shown in the research strategy in Table 1.

Table 1 - Research strategy		
Database	Research terms (Descriptors)	Results
Scopus	<i>“palliative care” OR “palliative medicine” OR “terminal patient” OR “end of life care” OR “terminal care” AND “resident doctors” OR “medical residency” OR “medical students” AND “knowledge” OR “practices”</i>	377
EMBASE	<i>palliative care OR palliative medicine OR terminal patient OR end of life care OR terminal care AND resident doctors OR medical residency OR medical students AND knowledge OR practices</i>	216
Wed Science	<i>“palliative care” OR “palliative medicine” OR “terminal patient” OR “end of life care” OR “terminal care” AND “resident doctors” OR “medical residency” OR “medical students” AND “knowledge” OR “practices”</i>	201
MEDLINE/ PubMed	<i>“palliative care” OR “palliative medicine” OR “terminal patient” OR “end of life care” OR “terminal care” AND “resident doctors” OR “medical residency” OR “medical students” AND “knowledge” OR “practices”</i>	114
BDTD/Gray Literature	<i>“palliative care” OR “terminal patient” OR “final stage of life” OR “resident doctors” OR “medical residency” AND “knowledge” OR “practices”</i>	16
Cochrane Library	<i>“palliative care” OR “palliative medicine” OR “terminal patient” OR “end of life care” OR “terminal care” AND “resident doctors” OR “medical residency” OR “medical students” AND “knowledge” OR “practices”</i>	08
<b>Total</b>		<b>931</b>

Table 2 - Descriptive synthesis of the included studies

Authors / Year / Country	Objective	Method			Results	Conclusions
		Sample size / Sex / Age / groups	Design of The study	Instruments		
Yacht, Suglia, Orlander [25]  2007  The United States	To assess the rotation impact in knowledge and attitude of residents at end-of-life.	(n = 88 residents)  Men = 42 (48%)  Women = 46 (52%)  Average age = 29.7 to  Intervention Group: Postgraduate year one (PGY2) = (R2) 43 (48.89%)  Control Group: Postgraduate year two (PGY3) = (R3) 45 (51.13%)	Intervention Study (almost-experimental)	Objective knowledge: Multiple choice survey adapted from David E. Weissman, MD (personal communication)  Subjective knowledge: questions in 9 areas of knowledge on 5-point Likert scales	Objective knowledge:  PGY2: (R2)  Pre-test = 59 points  Post-test = 73 points  PGY3: (R3)  Pre-test = 60 points  Post-test = 62 points  Subjective knowledge:  A total of 77% of participants indicated that 50% or more of the material presented in the rotation was new to them.  The self-assessment score was significantly higher ( $p < 0.001$ ) in the post-rotation assessment compared to the retrospective pre-rotation score for all nine questions.	The one-week rotation improved knowledge of PGY-2 (R2) residents in palliative care for end-of-life patients.
Brock, Cohen, Sourkes, Good, Halamek [26]	To assess the relative effectiveness	(n = 35 residents)		Pediatric Palliative Care Survey (PPCS)	The results of the PPCS tests related	Simulation-based program is an effective

2017 United States	of training based on simulation versus training in self-efficacy (comfort), knowledge and satisfaction of residents in pediatrics with medical education in Palliative Care.	Men = 07 (20%) Women = 28 (80%)  Average age = 32.1 to  Intervention Group (Simulation training): 17 (50%)	Intervention Study	to the knowledge of both groups, were improved:	method for improving palliative care comfort, knowledge and consultation. Probably more frequent practice is needed to lead to sustained improvements in communication competence.	
		Control Group (Didactic Training): 17 (50%)		Simulation-based training:  Start = 7.3 (1.8);  After 3 months = 8.4 (1.2)  Mean (SD) of difference = +1.1 (1.9)   Didactic training:  Home = 6.4 (1.0)  After 3 months = 8.2 (1.0)  Mean (SD) of difference = +1.8 (1.3)  There was no significant difference between groups:  Average = -0.7 (p = 0.20)		
Burge, McIntyre, Kaufman, Frager, Cummings, Pollett [27]  2000 Canada	To assess knowledge and attitudes of family medicine residents towards end-of-life care.	(n=57 residents)  Postgraduate year one (PGY1) R1 = 31(54.38%)  Postgraduate year two (PGY2) R2 = 26 (45.62%)	Cross-sectional	Quality care at the end-of-life	Total knowledge score:  PGY1 (R1) = 14.6 (3.7)  PGY2 (R2) = 15.64 (2.5)	There were no significant differences found between PGY1s (R1) and PGY2s (R2) with regard to knowledge of residents in palliative care at the end of life, which may indicate that the postgraduate program in residency did not develop

						such knowledge.
Mohanti, Bansal, Gairola, Sharma [28]  2001 Índia	To assess aspects of awareness, clinical knowledge and education and training in palliative care among clinical residents of a tertiary care hospital.	(n = 49 residents)  Oncology = 23 (46.9%)  Non-oncological = 26 (53.1%)	Cross-sectional	Questionnaire about palliative care education and training during residency	The knowledge and training provided in palliative care were considered:  Sufficient = 04 (8.2%)  Little enough = 20 (40.8%)  Insufficient = 25 (51.0%).	The knowledge during residency was considered "insufficient" and both groups of residents felt that they were inadequately trained in palliative care.
Alamri [29]  2012 Arábia Saudita	To determine residents' knowledge who work at King Abdul-Aziz University Hospital (KAAUH) about palliative care.	(n = 80 residents)  Men = 39 (49.2%)  Women = 41 (50.8%)  Average age = 29.1 years	Cross-sectional	Questionnaire: Quality care at the End of Life – knowledge of Care at the End of Life	The percentage of correct answers in palliative care varied between 0% and 60%, with an average value of 29.9% ± 9.9%.	Resident doctors know just a little about basic palliative care.
Luthy, Cedrasci, Pautex, Rentsh, Piguet, Allaz [30]  2009 Suíça	To investigate the difficulties perceived by internal medicine residents in hospitalized terminal patients care.	(n=24 residents)  Men =15 (63%)  Women = 9 (37%)  Average age = 28.0 years	Qualitative study	Open question	The analysis raised eight categories that cover difficulties expressed by residents, among which theoretical knowledge stood out, with 9 residents (38%) considering this item as one of their	The knowledge about care for hospitalized terminal patients was perceived as one of the main difficulties.

					main difficulties.	
Gibbins, McCoubrie, Forbes [31]	To explore residents' experiences with patients in palliative care needs, what and how they learned in medical school during the first year of residency (FY1- Foundation Year - R1).	(n = 21 residents)  Men = 07 (33.3%)  Women = 14 (66.7%)  Average age = 26.5 years	Qualitative study	Semi-structured interviewed script	At post-graduate level, doctors competencies of FY1 (R1) in palliative care at end-of-life care can be evaluated using case-based discussions.  FY1 doctors (R1) highlighted difficulties they face in the prescription of medications at end-of-life and the reasons for their use.	Newly qualified doctors realize that they receive little formal education on palliative or end-of-life care in their new role, and the culture in the hospital environment does not encourage learning on this subject. They also learn with 'trial and error while 'doing the job', but their skills and knowledge are limited.
2011						
Reino Unido						

### Data selection and extraction

The three researchers conducted the research and selected the studies independently, using specific reference management software (EndNote Web).

The selection took place in four stages and after each one, the researchers verified inclusions and exclusions, seeking consensus among the results. There was no need for a reviewer to solve differences.

In phase 1 (Identification), the studies were searched and the duplicates were identified, using the EndNote software, and then removed;

In phase 2 (Screening), the titles and abstracts of the articles were read and the exclusion and inclusion criteria were applied;

In phase 3 (Eligibility), there was a manual research and the reading of the full articles was carried out and then those which met the eligibility criteria were selected (Participants, Exposure, Comparison, Results, Study design);

In phase 4 (Inclusion), a table was constructed with the authors identification, objectives, methods, results and conclusions and a subsequent qualitative synthesis of the studies.

Relevance Tests were applied and it directed the exclusion and inclusion of the studies in each phase, as follows:

Phase 1 (Identification): The duplicates were identified.

Phase 2 (Screening): The following questions were answered:

Title Reading:

1. Was the study made with a resident doctor?
2. Was the study about palliative care?

Abstract Reading:

1. a) Was the study made with a resident doctor?
2. b) Was the study about palliative care?
3. c) Was the study about knowledge and/or practices?

Phase 3 (Eligibility): Full Articles reading.

1. a) Was the study made with a resident doctor?
2. b) Was the study about palliative care?
3. c) Was the study about knowledge and/or practices?
4. d) Was the study written in Portuguese, English or Spanish?

Phase 4 (Inclusion): After the reading of the full articles, a table was constructed with the synthesis of those selected.

### **Risk of Bias (Risk of Bias - RoB)**

To assess the risk of bias in the selected studies, the tools of Joana Briggs Institute - JBI [24] were used, considering the studies that met the JBI requirements in ( $\geq 7$  points) of "high" quality and low risk of bias. Those which scored 5 to 6 points were classified as "medium" quality and moderate risk of bias. The articles that achieved a score ( $\leq 4$  points) were considered to have "low" quality and a high risk of bias.

### **Summary of Evidences**

The reading of the full articles enabled to verify that the studies are heterogeneous, which compromised the performance of a meta-analysis.

A table was constructed with the authors identification, objectives, methods, results and conclusions with subsequent comparative studies synthesis.

## **Results**

### **Studies Selection**

Initially, 931 records were identified in the databases. 363 duplicates were excluded, leaving 568 for the next phase.

458 were excluded during the reading phase of the titles and 86 when the abstracts were read because they did not meet the inclusion criteria, leaving 24 records for full reading.

No records were found in the manual search, remaining 24 for the full text reading.

Upon reading the complete studies, 17 records were excluded. Seven studies were selected for comparative data synthesis, as shown in Picture. 1.

### **Descriptive Synthesis of the included studies**

#### **Tabela 2**

Seven articles met the inclusion criteria, as well as this work proposal.

Regarding the geographical region where the studies were developed, they were published in Canada, India, Switzerland, the United Kingdom, Saudi Arabia and the United States.

With regard to the study type, it was found: three intervention [25, 26, 27], two cross-sectional [28,29] and two qualitative [30, 31].

In the observed data, all studies analyzed had a sample of less than 100 subjects. 42.86% had a sample of between 50 and 100 subjects and 57.14% had a sample of less than 50 subjects.

The total of sample from the referred research was 442 subjects, being 137 (30.99%) women, 111 (25.12%) men and 194 (43.89%) individuals without gender specification. The average age ranged from 26.6 to 32.1 years.

In relation to instruments, each article used a different instrument for data collection, such as: multiple choice survey adapted from David E. Weissman, MD (personal communication) [25], Pediatric Palliative Care survey ( PPCQ) [26], Quality care at end-of-life [27], survey on palliative care education and training during residency (instrument's name was not identified in the study) [28], Quality care at the end-of-life - knowledge of care at end-of-life [29] and interview script [30, 31]. The instruments used in studies 26 and 29 were previously validated; the others were in the process of validation or this item was not mentioned.

The studies are heterogeneous, both in terms of objectives and instruments, as well as in the residents' area of acting and in the results presentation. The articles were divided into groups, three of which were developed in medical clinic [29, 30, 31], one in pediatrics [26], one in oncology [28], one in family medicine [27] and one in rotation system [25].

As for the teaching method, simulation techniques, didactic training and rotation in hospital units were used in the articles studied.

Studies [25, 27, 31] indicate that they received support from universities and foundations; the other studies were not supported or did not specify this item. Only one study [31] showed the presence of conflict of interest.

The studies' results [27, 28, 29, 30 31] demonstrate that residents' knowledge of palliative care is limited and insufficient. In addition, in one study [27] it was observed that there was no significant difference between first and second year residents.

Knowledge of hospitalized terminal patients care was perceived as one of the main difficulties among resident doctors, who admit to have little knowledge of basic palliative care.

Newly qualified doctors realize that they receive little formal education on palliative or end-of-life care in their new role, and the culture in the hospital environment does not encourage learning on this subject. And that most of them learn with 'trial and error' while 'doing the job', but that their skills and knowledge are limited.

No significant differences were found between R1 and R2 [27] with regard to residents' knowledge in palliative care at the end-of-life, which may indicate that the medical residency program did not develop such knowledge. Some resident doctors have stated that the rotation system has improved knowledge on palliative care for end-of-life patients.

As for the simulation-based program, it proved to be an effective method to improve comfort, education and consultations in palliative care, but a more frequent practice is needed to lead to sustained improvements in communication skills.

The studies [25, 26] present rotation and simulation programs as effective methods of improving knowledge in palliative care during medical residency period, without, however, statistically significant difference.

### **Risk of Bias Assessment**

The Bias risk analysis was carried out with the Joanna Briggs Institute's instruments according to each type of study, as shown in Table 3.

Table 3 Bias risk evaluation instrument (Joana Briggs)

Studies/Questions	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	%S
Yacht, Suglia, Orlander [25] 2007 USA Intervention Study (Quasi-experimental)	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	100
Brock, Cohen, Sourkes, Good, Halamek [26] 2017 USA Intervention Study (Randomized Clinical Trial)	Y	Y	Y	Y	Y	Y	Y	Y	N	NA	89
Burge, McIntyre, Kaufman, Frager, Cummings, Pollett [27] 2000 Canada Cross-sectional Study	Y	N	Y	Y	N	N	Y	Y	NA	NA	62
Mohanti, Bansal, Gairola, Sharma [28] 2001 Índia Cross-sectional Study	Y	N	N	U	N	N	U	Y	NA	NA	25
Alamri [29] 2012 Arábia Saudita Cross-sectional Study	Y	Y	Y	Y	N	N	Y	Y	NA	NA	75
Luthy, Cedrasci, Pautex, Rentsh, Piguët, Allaz [30] 2009 Suíça Qualitative Study	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100
Gibbins, McCoubrie, Forbes [31] 2011 Reino Unido Qualitative Study	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100

Caption: Y = Yes; N = No; U = Uncertain; NA = Not applicable

According to the results, the studies [25, 26, 29, 30, 31] had a low risk of bias, which means high quality; one study [27] had a moderate risk of bias, meaning medium quality and only one study [28] had a high risk of bias, showing low quality.

## Discussion

This general objective of this review is to identify the resident doctors' knowledge regarding palliative care. As far as it is known, no systematic review found addressed this topic, which justifies the elaboration of the study in question.

The studies analyzed in this review show that resident doctors' knowledge proved to be limited and insufficient in relation to palliative care. It was not possible to assess whether there are differences in the level of knowledge of residents in relation to age, sex, medical specialty, stage of residence, geographic location where the studies were carried out and instruments used for data collection.

In the study by Luthy et al. [30] some difficulties in palliative care are also identified, such as: ability to provide adequate information, understand patients' needs, have sufficient theoretical knowledge, recognize limitations as a professional and also be prepared to help patients and their families. In the research by Brugugnolli, Gonsaga and Silva [32], doctors knowledge about palliative care proved to be precarious, pointing to the need for specific education on this topic.

The study by Roldi and Moritz [33] concluded that due importance is not given to palliative care and that there is a need for optimization and dissemination of this topic among health professionals, mainly due to the growth of aging population and the consequent increase in the prevalence of non-communicable chronic diseases.

Such results may be related to the fact that undergraduate programs do not offer sufficient and adequate training focused on knowledge in palliative care [7], which demonstrates the need for changes in the undergraduate courses program with the inclusion of disciplines and practices aimed at this topic and change in the behavior of health professionals with regard to palliative care practices [34].

The study by Conceição et al. [35] concluded that most doctors did not receive enough information about terminally ill patients at graduation and only a small amount had high rates of correct answers in specific questions. This result points to the flaws and the need for changes in medical training.

In Schaefer's study [36], some skills needed by resident doctors [were] pointed out that can be used to measure the training process' results in palliative care. Such skills must be developed on both undergraduate and medical residency.

For Arai et al. [37] in the medical residency period, skills should be taught in the direction of how to deal with uncertainties, contradictions and limitations, as well as provide opportunities for communication with other members of the multidisciplinary team and promote moments for the residents' experiences to be shared and discussed collectively.

In a study [38] carried out in The United States, competence-based training in primary palliative care was implemented and the results were positive, as it enabled greater learning for pediatric residents. The results of this study show that there was no significant difference between first and second year residents, which reinforces the need for improvements also in residency programs, with greater use of teaching-learning methods that emphasize practice, such as rotation and simulation, which can also be observed in the study by Yacht, Suglia and Orlander [25].

Besides the methods presented, the home visit of patients is shown to be an effective way of training residents in palliative care, which in Brazil is provided for in the Family Health Program [39].

Also in Brazil, Ordinance 859/2002 [10] included the palliative care practice in oncology services. In 2011 the Brazilian Medical Association (BMA) recognized Palliative Medicine in six areas and six medical specialties: Pediatrics, Family Medicine and Community, Medical Clinic, Anesthesiology, Oncology and Geriatrics. Medicine Federal Council (MFC) launched Resolution 1995/2012 [10] on Anticipated Directives of Will. There was also the certification of the first Brazilian doctors in Palliative Medicine as an expertise area. Palliative Medicine was recognized as an area of expertise in two additional specialties: Intensive Medicine and Head and Neck Surgery. Resolution 41/2018 [10] provides guidelines for palliative care organization, however, it is very clear the need for more effective actions aimed at knowledge and specific practices, especially in medical residency [10].

## Strengths And Limitations

One of this study's strengths is the fact that it is a systematic review of literature, as it allows syntheses and analyzes from other studies and as far as is known, this is the first systematic review on the topic. Another relevant aspect is low risk of bias found in the selected articles, which demonstrates their high quality and consequently strengthens the conclusions of this review.

One of this review's limitations is the relatively small amount of primary studies found that emphasize the knowledge of resident doctors in palliative care, especially in developing countries, more specifically in Latin America. Another limitation is the high heterogeneity of the studies, which made the analysis difficult, mainly by subgroups.

In databases used for this review, no study was found that addressed the practices of resident doctors related to palliative care, which made it impossible to achieve one of the specific objectives of the research and highlights the need for investments aimed at practice, not only knowledge.

It was not possible to assess knowledge variation in the different medical specialties due to the diversity of instruments and ways of presenting the results (average, percentage, total score, content analysis by categories).

## Conclusion

The studies analyzed in this review show that resident doctors' knowledge proved to be limited and insufficient in relation to palliative care, which reveals the need for greater investments in training, through teaching-learning methods based on rotation, simulation and other techniques, improving thus, not only knowledge, but also the practice in palliative care.

In view of this conclusion, it is suggested that new primary studies be carried out, taken place mainly in developing countries, in order to increase the quantity of publications on this topic. This systematic review explains the flaws in the educational process of resident doctors, pointing out the need for improvements in the undergraduate educational program and medical residency program.

## Abbreviations

BPCA	Brazilian Palliative Care Association
NAPC	National Academy of Palliative Care
BMA	Brazilian Medical Association
BDTD	Brazilian Digital Library of Theses and Dissertations
PC	Palliative Care
FCM	Federal Council of Medicine
NCG	National Curricular Guidelines
CH	Clinical Hospital
NCI	National Cancer Institute
ME	Ministry of Education
WHO	World Health Organization
FUG	Federal University of Goiás

## Declarations

8.1 Ethical approval and permission to participate: Not applicable

8.2 Consent for publication: Not applicable

8.3 Availability of data and material: The data sets generated and / or analyzed during the current study are available from the corresponding author upon reasonable request.

8.4 Competitive interests: The authors declare that they have no competing interests.

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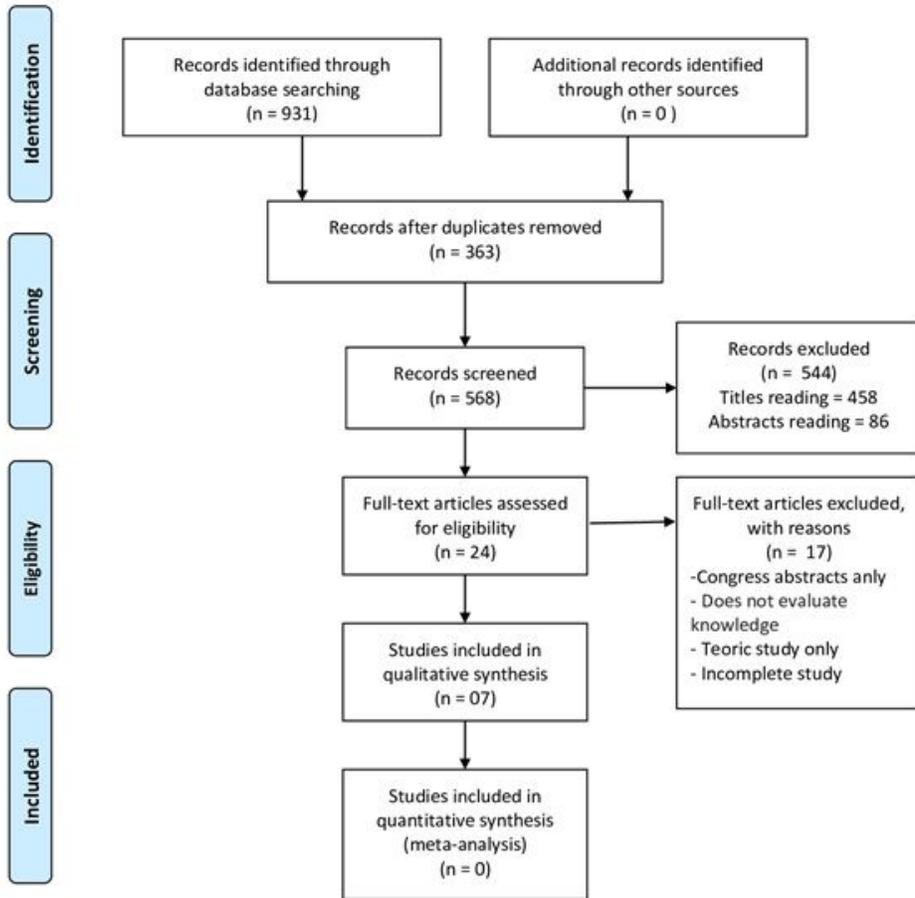
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## Figures



**Figure 1**

Flux Diagram (PRISMA)

## Supplementary Files

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