

# Teaching Methodologies Regarding Palliative Care Competencies on Undergraduate Nursing Students: A Systematic Review

*by Tintin Sukartini*

---

**Submission date:** 06-Jan-2022 08:38AM (UTC+0800)

**Submission ID:** 1737934809

**File name:** tintin-NLP-Inca-Buntari-Agustini\_28072021-new.pdf (670.47K)

**Word count:** 3414

**Character count:** 19574

## 4 Teaching Methodologies Regarding Palliative Care Competencies on Undergraduate Nursing Students: A Systematic Review

Ni Luh Putu IB. Agustini<sup>1</sup>, Nursalam Nursalam<sup>2\*</sup>, Tintin Sukartini<sup>3</sup>, Gst. Kade Adi W. Pranata<sup>4</sup>, Ni W. Suniyadewi<sup>5</sup>, I Dewa A. Rismayanti<sup>6</sup>

1. Candidate of Doctor in Nursing, Faculty of Nursing, Universitas Airlangga / Indonesia.
2. Professor in Nursing, Head of Doctoral Nursing Program, Faculty of Nursing, Universitas Airlangga / Indonesia.
3. Doctor in Nursing, Faculty of Nursing, Universitas Airlangga / Indonesia.
4. Master of Science in Nursing, Nursing Department, Institute of Technology and Health Bali / Indonesia.
5. Master of Health, Nursing Program, STIKes Wira Medika Bali / Indonesia.
6. Master's in nursing, Nursing Program, STIKES Buleleng / Indonesia.

### Abstract

The teaching problem in undergraduate nursing students (UNS) is a lack of empirical evidence of teaching methodologies for achieving palliative care competencies (PCC). The purpose of this review was to synthesize the evidence of palliative care (PC) teaching methodologies for UNS and their effectiveness to achieve PCC.

Four electronic databases were searched, including Scopus, ProQuest, PubMed, and CINAHL, from 2015 to 2020. Full-text available, published in peer-reviewed journals, written in English and aimed at verifying the effectiveness of teaching methodologies for achieving PCC were included. The Critical Appraisal Skills Programme (CASP) checklist was used to appraise the trustworthiness, relevance, and the results of published papers.

Five studies were considered relevant for this systematic review. The learning methodology carried out to achieve PCC for UNS varies from multimodality approaches, simulation-based experience to high fidelity simulation. Kolb's Experiential Learning Theory proved to be effective in improving students' PCC, especially in the aspects of knowledge, attitude, comfort, and self-awareness.

The learning methodology identified in this review was proven to be effective to improve the PCC on UNS; simulation being the most widely applied method in teaching strategies.

Review (J Int Dent Med Res 2021; 14(3): 1302-1308)

**Keywords:** Palliative care competencies, teaching methodologies, undergraduate nursing students.

**Received date:** 19 January 2021

**Accept date:** 06 August 2021

### Introduction

The World Health Organization (WHO) defines palliative care (PC) as an integrated system of care provided to patients suffering from chronic or terminal illness from the time the diagnosis is made to the end of the patient's life. It is a people-centered approach to care that takes into account physical, psychological, social and spiritual aspects associated with a life-threatening illness<sup>1</sup>. During the sequence of their

illness, patients need expert care including end of life care. This generates a need for longer-term comprehensive care to shelter-term curative treatments and to maximize the quality of life of patients during their illness.<sup>6</sup> WHO also states the importance of PC care and end-of-life care (EOL) and recommends that these treatments could be offered early in the course of a serious illness. Unfortunately, most postgraduate nurses feel unprepared to provide care to patients with serious illnesses or patients who are dying<sup>2-5</sup>. This condition highlights the need for education and training on PC for UNS.

Education is the key to develop quality of human resources and a tool to kind an important transformation in learners' knowledge and comfort about PC. Without the right learning strategies and approaches, students will not be able to carry out PC holistically. After receiving

#### \*Corresponding author:

Nursalam Nursalam,  
Professor in Nursing, Head of Doctoral Nursing Program, Faculty of Nursing, Universitas Airlangga / Indonesia.  
E-mail: nursalam@fkip.unair.ac.id

education in palliative nursing, graduates must be able to demonstrate competency in PC in an effective, fair, and high-quality manner to terminally ill and dying patients. Expectations about the ability to do PC and EOL care are sources of stress and anxiety for UNS, demonstrating the necessity for the right teaching methodologies before graduating.

EOL communication skills and PC, as well as the ability to define an EOL care plan, can be a particular challenge for graduate nursing graduates. It is important to intensify the stimulus for the theoretical and practical teaching of PC in higher education with an appropriate teaching methodology. In other cases, even though the UNS have received education about PC, the teaching methodology that has been applied has never been explored for its effectiveness on the achievement of students' competencies regarding PC.

To the best of our knowledge, there has been no systematic review of learning methods that evaluates the achievements of PC competencies. Although, the findings of previous studies in PC show their effectiveness to increase the achievement of PC competence through various learning strategies, there is a lack of empirical evidence on how these learning strategies evaluate the achievement of student competencies in performing PC. Therefore, the purpose of this review was to synthesize the evidence in teaching methodologies applied for UNS in PC and their effectiveness in achieving PCC competencies from existing documents.

## Materials and methods

A systematic review was performed in 2020 based on the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) statement guidelines for systematic reviews<sup>5</sup>.

We searched four databases (Scopus, ProQuest, PubMed, and CINAHL) from 2015 to 2020. The search strategy comprised in terms of population<sup>2</sup>, intervention context, outcome, timing, setting and study designs (PICOTSS), as reported in Table 1. A search also<sup>2</sup> was done to get additional potential articles. The following research terms were used by applying Boolean operators: "undergraduate nursing students" OR "nursing students" OR "student nurses" AND "learning styles" OR "learning modalities"<sup>14</sup> OR "learning strategy" OR "learning methods" AND

"palliative care" OR "end-of-life care" OR "terminal care" OR "hospice care" AND "students' course learning outcome" OR "palliative care competencies", combined as MESH terms and keywords.

Population	Undergraduate nursing student, nursing student, student nurses
Intervention	Learning style, learning modalities, learning strategy, learning method
Context	Palliative care, end-of-life care, terminal care, hospice care
Outcome	Measures of students' course learning outcome, or palliative care competencies
Timing	Studies could be of any duration and follow-up period
Setting	Studies conducted in nursing institutions settings on multiple geographic locations
Study design	Randomized controlled trials Quasi-experimental Open trials

Table 1. Search questions.

Titles and abstracts were screened. Furthermore, the authors peruse the full text when the title and abstract of the found article were unclear. The process preliminary was carried out indecently, then the authors approved the study to be included; any disagreement was<sup>12</sup> resolved through dialogue among the authors. Studies were included if they met the following inclusion criteria: 1) the design or study method must be randomized controlled trials or quasi-experimental or open trials; 2) participants involved must be UNS; 3) the method used in teaching PC should be the primary intervention; 4) PCC should be the primary outcome; 5) research articles must be published in English, open access and free to download, provide full-text and there is no duplication in the database.

A total of 5969 articles was identified through electronic relevant databases (Scopus 5 articles, ProQuest 107 articles, PubMed 5784 articles, and CINAHL 73 articles). Five thousand nine hundred and twenty-three articles were rejected leaving only 46 articles whose titles matched the keywords and after the duplication was removed. After inspecting with abstract checking<sup>13</sup> checking the full text then proceeded and 41 articles were excluded because they did not meet the inclusion or exclusion criteria.

Data were extracted using a predesigned and piloted template including the following variables: identification of the study (title, author), country where the study was performed and the year(s); research methodology, which is abbreviated using DSVIA (D: study design, S: sample, V: Variable, I: instrument, and A: analysis), and summary (see Table 2).

## Results

Initially, 5969 articles were retrieved, and 5964 articles were excluded. Finally, five articles were included. A summary of the studies and their findings are presented in Table 2. The majority of studies included were conducted in United States of America (USA)<sup>6, 8–10</sup> and one study in Pakistan<sup>7</sup>. Those studies evaluated the effects of teaching methodologies regarding palliative and end-of-life care education on UNS competencies.

PC education at the UNS level was presented either as a separate elective course<sup>6–9</sup> or through the ELNEC core course<sup>11</sup>. There was a wide range of duration of palliative education, from two days to two years. Glover et al. (2017) conducted a 2-day ELNEC core course with pre and post ELNEC assessments. Mason et al. (2020) implemented a multimodality approach for over 15 weeks, which included topics related to palliative nursing communication, grief, bereavement, pain and symptom management, loss, and final hours of life guided by end-of-life nursing consortium modules. Palliative nursing lectures were carried out for two 2 semesters. Kirkpatrick, Cantrell and Smeltzer, (2020) undertook a study during the fall semester and continued into the spring semester. The activity began with a PC lecture and continued with an end-of-life simulation-based experience. Rattani et al. (2020) organized a palliative nursing course for four semesters over a period of two years.

UNS PC education is underpinned by experiential learning theory. Experiential learning theory by Kolb's was applied to develop the curriculum. The theory focuses on the standing of the learner moving through four phases, namely abstract conceptualization, concrete experiences, reflective observation, and active experimentation<sup>10</sup>. Through these phases, each student had a 4-hour observation experience in a hospice or PC setting with a provider. Coursework involved a critical reflection on their observational experiences and an analysis of a PC case study.

A mix of both didactic/clinical and experiential educational strategies is reported. Mason et al. (2020) used a multimodality class by utilizing various learning methods, including lectures, games, simulations, computerized learning modules, small group discussions,

reading, and reflection. Each student had a 4-hour observation experience with a provider in a hospital or PC setting. Assignments included reflection on their observational experiences and analysis of PC case studies. Rattani et al. (2020) applied a mixed learning method; teaching and didactic discussions face-to-face as well as synchronized online discussions among students in small groups under the supervision of the nursing faculty. Kirkpatrick, Cantrell and Smeltzer (2020) implemented a 45-minute structured initial briefing highlighting key elements of student preparation materials including principles of effective communication, teamwork and collaboration, patient advocacy, symptom management and post-mortem care. After the simulation briefing, nursing students were randomly assigned to take an active role or make observations by drawing the roles from a deck of cards. Carman et al. (2016) applied a death and dying learning bundle with a one-hour class discussion focused on students' concerns about EOL care in general, competencies and abilities to control symptoms such as pain, incontinence, dyspnea, and spiritual distress. Legal considerations for brain death diagnosis, postmortem care, and the impact of these factors on the family were included in part of this learning package. At the end of the hour, case studies were reviewed for their relation to the simulation experience. Glover et al. (2017) applied interactive learning activities through case studies and presentations.

This review shows an effectiveness of the teaching method have been evaluated using quasi-experimental designs, including: a pilot study with a pre and post quasi-experimental design<sup>6</sup>; pre- and post-intervention without control group<sup>7,9</sup>; and one-group repeated measure (pre-test/post-test) design with within-subject (knowledge and self-awareness) and between subject (active versus participant role)<sup>8</sup>. One study used a descriptive pre- and post-assessment after attending the ELNEC core course<sup>10</sup>.

Outcome measures included students' knowledge, attitude and comfort on performing palliative and end-of-life care<sup>6</sup>, students' attitude on performing end-of-life care<sup>7,9</sup>, palliative and end-of-life care knowledge<sup>10</sup> and self-awareness outcomes in PC<sup>8</sup>.

The valuation of study outcomes was mostly measured using validated instruments

such as the FATCOD scale to assess attitudes toward care of the dying<sup>6-9</sup>, PCQN to assess students' PC knowledge<sup>6,8</sup>, EOL SBE scenario<sup>8</sup>, and ELNEC guideline<sup>10</sup>.

The positive impact of PC education, especially on attitudes, has been reported<sup>6,7,9</sup>. Mason et al. (2020) reported a significant change in UNS attitudes and comfort toward PC ( $z = 0.017$ ,  $P < .05$ ). Rattani et al. (2020) also reported substantial attitude transformation noticed on 11 of 30-FATCOD items (t-value was significant at 0.05 alpha value (one-tailed). Similarly, Carman et al. (2016) found that bundled teaching strategy led to a significant reduction in negative attitudes about discussing the death ( $P < .03$ ) or being present at the time of actual death ( $P < .04$ ) and providing adequate analgesia during the dying process without fear of causing addiction ( $P < .01$ ). The three studies in this review also reported positive changes in the knowledge aspect as measured by PCQN<sup>6,8,10</sup>. Furthermore, Kirkpatrick, Cantrell and Smeltzer, (2020) reported a statistically significant increase in self-awareness in the group (M diff = 6.0; 95% CI 4.2-7.8;  $P < 0.001$ ) after participating in EOL SBE activity.

## Discussion

The palliative learning implementation was varied across studies from multimodality approaches, simulation-based experience to high fidelity simulation. Glover et al. (2017) argued nurse educators can integrate content about palliative and end-of-life care into standard nursing curricula using ELNEC core courses. The embedded content approach can simplify the integration of PC into the curriculum without adding material that might already be extensive. Meanwhile, some authors argue that discrete courses are more beneficial as they allow better assimilation of material with students. While there is evidence of the effectiveness of both approaches in improving PCC in term of death and the care of the dying, incorporating PC content into other nursing courses or offering separate courses as elective subjects may not provide the attention it deserves for PC education. In addition, the lack of evidence of the effectiveness of separate courses over the embedded content approach requires more research.

End-of-life PC content remains unclear as

to whether it should be taught at an early or later stage of nursing courses. Although it is recommended that it be given at a later stage because students already have related knowledge about PC<sup>9</sup>, earlier application has been shown to prevent them from developing misunderstandings during clinical practice. This suggests that pronouncements about when to include PC education at the undergraduate level of nursing should be thoroughly discussed.

The combination of didactic and experiential teaching and learning strategies has been proven to be effective in improving student learning about PC. In addition, relevance provides students with occasions to care for dying patients in administered simulations and highlighted real-life circumstances, thus suggesting that the delivery of theoretical content without experience to practice is inadequate. Our review finds theory underpinning palliative education remains inconclusive; however, one of the studies which employed Kolb's Experiential Learning Theory showed significant effect on knowledge, attitude, and comfort of PC<sup>6</sup>. Similarly, teaching EOL care through high fidelity simulations has improved students' attitudes toward the care of dying patients and their bereaved family members<sup>7</sup>. Previous research has also proven that PC education at the undergraduate level of nursing is effective in enhancing the knowledge, attitudes, and skills of care for dying patients and their families<sup>13-15</sup>. However, the use of non-probability sampling methods and self-assessment evaluation instruments in this study may generate some bias.

Moreover, the outcomes of these studies without a control group may have been influenced by unnecessary variables. The use of small sample sizes raises methodological problems regarding representativeness and generalizability of results. Expected results in designing course objectives and evaluation strategies need to consider the insertion of cognitive, affective, and psychomotor domains. This will increase understanding of how PC education impacts UNS knowledge, attitude, and skills.

The educational strategy applied in this review was mostly implemented in resource-rich countries. Therefore, it requires adaptation when applied in resource-poor countries to bridge barriers such as the lack of specialist PC

practitioners or educators, absence of PC units in hospitals and community, and issues in access to PC textbooks, journals, and online educational materials. Further research in PC education is needed, especially the comparison of various educational strategies (both in the classroom and clinical setting) for palliative and end-of-life care to determine their strengths and weaknesses. Another learning model approach also needs to be developed to meet the challenges of PC earlier and more comprehensively.

### Conclusions

A systematic review revealed that PC education is proven to be effective to improve the PCC in UNS, especially in the aspects of knowledge, attitudes, comfort, and self-awareness. PC education at the UNS level was offered either as a separate elective course or ELNEC core course. Both didactic and experiential educational strategies are used, and

education is delivered to students in a variety way. Courses that are supported by experiential learning theory are shown to improve knowledge, attitudes, and comfort in PC. Simulation is the method most applied in teaching strategies since it provides opportunities for students to learn how deal with their own emotions.

### Acknowledgements

The authors are very grateful to the reviewers for providing their comments on the first draft of the manuscript which assisted to revise and clarify the manuscript.

### Declaration of Interest

The authors declared that did not have potential conflicts of interest concerning the research, authorship, and/or publication of this research reported.

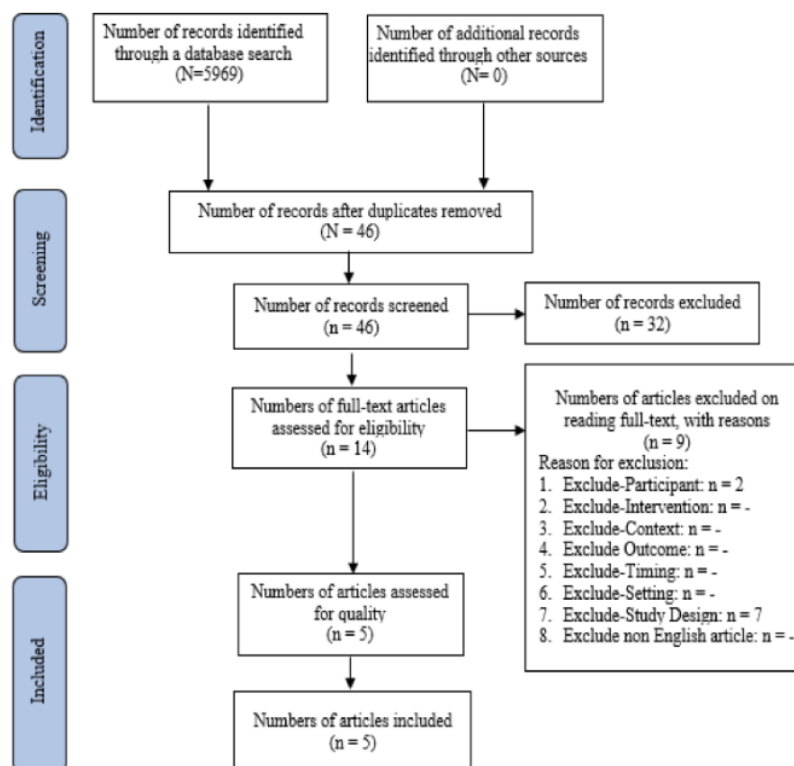


Figure 1. Article selection process.

No	Title. Author, Year	Research Methodology	Summary of findings
1	A Multimodality Approach to Learning: Educating Nursing Students in Palliative Care <sup>6</sup> .	<b>Study Design:</b> Quasi-experimental study design. <b>Sample:</b> 18 UNS at a large Midwest University. <b>Variable:</b> IV: Educating nursing students used an interactive and multimodality PC class. DV: Nursing students' attitude, comfort, and knowledge in palliative and EOL care. <b>Instrument:</b> 1. Palliative Care Quiz for Nursing (PCQN) 2. Frommelt Attitude Toward Care of the Dying (FATCOD) scale <b>Analysis:</b> A Wilcoxon matched pairs signed rank test.	There was a statistically significant increase in aspects of knowledge, attitudes, and comfort in providing palliative care, by utilizing Kolb's Experiential Learning Theory.
2	Effectiveness of High Fidelity Simulation in Nursing Education for End-of-Life Care: A Quasi-experimental Design <sup>7</sup> .	<b>Study Design:</b> A quasi-experimental design with pre- and post-intervention without control group. <b>Sample:</b> A total of 42 UNS at Aga Khan University School of Nursing and Midwifery Karachi, Pakistan. <b>Variable:</b> IV: High-fidelity simulation in Nursing Education for End-of-Life Care. DV: Attitude in participant students toward care of the dying. <b>Instrument:</b> FATCOD Part B. <b>Analysis:</b> Paired t-test	The learning method using high fidelity simulations significantly improves student attitudes towards the care of dying patients and their bereaved family members.
3	Palliative care knowledge and self-awareness in active and observing UNS after end-of-life simulation <sup>8</sup> .	<b>Study Design:</b> A quasi-experimental one- group repeated measure (pre-test/post-test) design with within-subject (knowledge and self-awareness) and between subject (active versus participant role). <b>Sample:</b> A convenience sample of 80 traditional undergraduate BSN students. <b>Variable:</b> IV: End-of-life simulation-based experience (SBE) DV: Active and observer nursing students' PC knowledge and self-awareness. <b>Instrument:</b> EOL SBE scenario, FATCOD-B and PCQN. <b>Analysis:</b> Two separate paired sample t- tests and ANCOVA	There was a statistically significant increase in aspects of knowledge and self-awareness in all participants after the SBE
4	Implementation of a Learning Bundle to Promote End-of-Life Education for Prelicensure Nursing Students <sup>9</sup> .	<b>Study Design:</b> A quasi-experimental design with convenience sampling. <b>Sample:</b> 62 nursing students at a large university in the southeastern United States. <b>Variable:</b> IV: A multidimensional EOL learning bundle. DV: Students' attitude toward care of the dying patients. <b>Instrument:</b> FATCOD scale <b>Analysis:</b> Two-sample t tests	The use of the EOL learning bundle can significantly improve the attitude of students in performing EOL care
5	Improving End-of-Life Care Knowledge Among Senior Baccalaureate Nursing Students <sup>10</sup> .	<b>Study Design:</b> A descriptive pre- and post-test after attending the End-of-Life Nursing Education Consortium (ELNEC) core course. <b>Sample:</b> A total of 125 senior nursing students. <b>Variable:</b> IV: ELNEC core course. DV: Knowledge on end-of-life care. <b>Instrument:</b> ELNEC guideline <b>Analysis:</b> McNemar test.	The results showed that students gained improved knowledge after participating in the ELNEC core course

**Table 2.** Studies included in this review.

### References

- Huang L-C, Tung H-J, Lin P-C. Associations among Knowledge, Attitudes, and Practices toward Palliative Care Consultation Service in Healthcare Staffs: A cross-sectional study. *PLoS One*. 2019;14(10):1-11.
- Achora S, Labrague LJ. An Integrative Review on Knowledge and Attitudes of Nurses Toward Palliative Care: Implications for Practice. *J Hosp Palliat Nurs*. 2019;21(1):29-37.
- Farmani AH, Mirhafez SR, Kavosi A, et al. Dataset on the Nurses' Knowledge, Attitude and Practice towards Palliative Care. *Data in Brief*. 2019;22(2019):319-25.
- Thrane SE. Online Palliative and End-of-Life Care Education for Undergraduate Nurses. *J Prof Nurs*. 2019.
- Bassah N. Impact of a Palliative Care Course on Pre-Registration Nursing Students' Palliative Care Knowledge. *Cent African J Public Heal*. 2019;5(2):58-64.

6. Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *J Clin Epidemiol.* 2009;62(10):e1-34.
7. Mason H, Burgermeister D, Harden K, Price D, Roth R. A Multimodality Approach to Learning: Educating Nursing Students in Palliative Care. *J Hosp Palliat Nurs.* 2020;22(1):82-9.
8. Rattani SA, Kurji Z, Khowaja AA, Dias JM, Alisher AN. Effectiveness of high-fidelity simulation in nursing education for end-of-life care: A quasi-experimental design. *Indian J Palliat Care.* 2020;26(3):312-8.
9. Kirkpatrick AJ, Cantrell MA, Smeltzer SC. Palliative care knowledge and self-awareness in active and observing undergraduate nursing students after end-of-life simulation. *Int J Palliat Nurs.* 2020;26(3):133-42.
10. Carman MJ, Sloane R, Molloy M, Flint E, Phillips B. Implementation of a Learning Bundle to Promote End-of-Life Education for Prelicensure Nursing Students. *J Hosp Palliat Nurs.* 2016;18(4):356-63.
11. Glover TL, Garvan C, Nealis RM, Citty SW, Derrico DJ. Improving End-of-Life Care Knowledge Among Senior Baccalaureate Nursing Students. *Am J Hosp Palliat Med.* 2017;34(10):938-45.
12. Mason H, Burgermeister D, Harden K, Price D, Roth R. A Multimodality Approach to Learning. Vol. 22, *Journal of Hospice & Palliative Nursing.* 2020;22(1):82-9.
13. Robinson E, Epps F. Impact of a Palliative Care Elective Course on Nursing Students' Knowledge and Attitudes Toward End-of-Life Care. *Nurse Educ.* 2017;42(3):155-8.
14. Lin J, Supiano KP, Madden C, McLeskey N. The Impact of the End-of-Life Nurse Education Consortium on Attitudes of Undergraduate Nursing Students Toward Care of Dying Patients. *J Hosp Palliat Nurs.* 2018;20(4):340-8.
15. Dimoula M, Kotronoulas G, Katsaragakis S, Christou M, Sgourou S, Patiraki E. Undergraduate nursing students' knowledge about palliative care and attitudes towards end-of-life care: A three-cohort, cross-sectional survey. *Nurse Educ Today.* 2019;74:7-14.



# Teaching Methodologies Regarding Palliative Care Competencies on Undergraduate Nursing Students: A Systematic Review

## ORIGINALITY REPORT

12%

SIMILARITY INDEX

11%

INTERNET SOURCES

7%

PUBLICATIONS

0%

STUDENT PAPERS

## PRIMARY SOURCES

1	<a href="https://ecommons.aku.edu">ecommons.aku.edu</a> Internet Source	2%
2	<a href="http://www.biomedcentral.com">www.biomedcentral.com</a> Internet Source	2%
3	<a href="http://journals.sagepub.com">journals.sagepub.com</a> Internet Source	2%
4	<a href="http://caresearch.com.au">caresearch.com.au</a> Internet Source	1%
5	<a href="http://www.science.gov">www.science.gov</a> Internet Source	1%
6	<a href="http://sigma.nursingrepository.org">sigma.nursingrepository.org</a> Internet Source	1%
7	Andra Davis, Megan Lippe, Toni L. Glover, Nanci McLeskey, Casey Shillam, Polly Mazanec. "Integrating the ELNEC undergraduate curriculum into Nursing Education: Lessons learned", Journal of Professional Nursing, 2021	1%

8 Payne, Sheila, Seymour, Jane, Ingleton, Christine. "EBOOK: Palliative Care Nursing: Principles and Evidence for Practice", EBOOK: Palliative Care Nursing: Principles and Evidence for Practice, 2008  
Publication 1 %

---

9 [bmcpublichealth.biomedcentral.com](http://bmcpublichealth.biomedcentral.com)  
Internet Source 1 %

---

10 Lee Hill, Jelena Popov, Melanie Figueiredo, Valentina Caputi, Emily Hartung, Michal Moshkovich, Nikhil Pai. "Protocol for a systematic review on the role of the gut microbiome in paediatric neurological disorders", Acta Neuropsychiatrica, 2021  
Publication <1 %

---

11 [www.ijmrhs.com](http://www.ijmrhs.com)  
Internet Source <1 %

---

12 [www.frontiersin.org](http://www.frontiersin.org)  
Internet Source <1 %

---

13 [www.termedia.pl](http://www.termedia.pl)  
Internet Source <1 %

---

14 [link.springer.com](http://link.springer.com)  
Internet Source <1 %

---

15 [wels.open.ac.uk](http://wels.open.ac.uk)  
Internet Source <1 %

---

---

Exclude quotes      Off

Exclude matches      < 10 words

Exclude bibliography      On