ORIGINAL ARTICLE

Reflections on an End-of-life Care Course for Preclinical Medical Students

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Background/Purpose: Undergraduate medical education lacks standardized curricula for teaching end-of-life care and only sporadic curricula evaluations have been reported. The objectives of this study were to evaluate the effect of a multimodal teaching program on preclinical medical students' knowledge of palliative care, and their beliefs relating to ethical decision-making.

Methods: This study had a quasi-experimental design. The teaching formats included didactic lectures, bedside patient care, and interactive discussions. A structured questionnaire evaluated the effects of educational intervention—in terms of knowledge of palliative care and beliefs about common ethical dilemmas relating to end-of-life care in Taiwan.

Results: All 118 students who participated in the study completed the questionnaire. Students showed significant improvement (score of 9.97 pre-test *vs.* 12.73 post-test; $p < 0.001$) in the 18-item palliative care knowledge questionnaire after educational intervention. Among the four common ethical dilemmas, students' beliefs of truth-telling (4.22 *vs.* 4.54; range 1–5; $t = -4.66$; $p < 0.001$) and place of care (4.37 *vs.* 4.52; range 1–5; $t = -2.43$; $p < 0.05$) were significantly improved. Logistic regression showed that the improvement in beliefs about ethical decision-making was not significantly influenced by improved knowledge of palliative care.

Conclusion: A 1-week multimodal curriculum for preclinical medical students can improve the knowledge and beliefs about ethical decision-making in managing terminally ill patients. Clinical skills of symptom management, especially pain control, and ethical decision-making regarding artificial nutrition and hydration should be emphasized in medical education, to promote students' competence in end-of-life care. [*J Formos Med Assoc* 2009;108(8):636–643]

Key Words: ethics, knowledge, medical, palliative care, students, terminal care

With increasing numbers of patients with cancer, AIDS, and other chronic, life-threatening illnesses, the care of patients with a terminal illness is becoming an important issue for doctors. Physicians' knowledge of palliative care and competence relating to ethical decision-making about end-of-life care are widely accepted to be deficient, which results in patients near the end of their lives receiving unsatisfactory care.[1] Two major reasons for unsatisfactory care are inadequate or inappropriate education about palliative care and the paucity of ethical decision-making training in the care of dying patients and their families. Before 1995, the average palliative care training time was < 10 hours in the United States and Canada.[2] Previously, palliative care curricula in

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the majority of US medical schools consisted of sporadic and isolated lectures. After recognizing this shortcoming, educational programs developed for palliative and end-of-life care have increased, and later reports have shown that most medical schools provided palliative or end-of-life care curricula in the United States and the United Kingdom.[3,4]

There is an increasing awareness of the need for more effective undergraduate curricula for end-of-life and palliative care, and the number of training courses has increased in the past decade. For better quality end-of-life care, education is required to enhance physicians' ability to care for terminally ill patients. Several types of teaching programs have been developed, including lectures, the use of role models, clinical problem solving, standardized patients, and multimodal learning courses.[5–7] Undergraduate medical education lacks standardized curricula for teaching palliative care and debate continues about what should be taught and how, and when and where the teaching should occur.

In July 2001, a new undergraduate curriculum was implemented at the Medical College of the National Taiwan University. The new curriculum was designed to increase emphasis on humanity in end-of-life care. The teaching formats included didactic lectures, bedside patient care, and interactive discussions. The goals of the integrated curriculum were to help students understand the needs of terminal patients and their families, to provide total care using the palliative care team, and to increase students' knowledge of palliative care. The study also aimed to evaluate the effects of a multimodal teaching program on medical students' knowledge of palliative care, and their beliefs relating to ethical decision-making.

Methods

Participants

A total of 118 third-year medical students, who voluntarily attended the 1-week educational program in the palliative care unit of National Taiwan University Hospital from 2001 to 2004 were recruited. Undergraduate medical education in Taiwan is composed of six curricular years and a 1-year internship. The third-year medical students were at the preclinical stage. The researchers distributed questionnaires to medical students at the beginning and at the end of the curriculum. The selection of participants and the design of this study were approved by the National Science Council in Taiwan and the Ethics Committee of the hospital.

Description of curriculum

A 1-week end-of-life curriculum called "Humans and Medicine" was developed in 2001 for preclinical medical students at the Medical College of the National Taiwan University. The teaching program is provided at the Palliative Care Unit of the National Taiwan University Hospital, and is composed of three learning modules, including a lecture series, bedside patient care, and interactive discussions (Table 1). The multidisciplinary faculty consisted of palliative care physicians, clinical social workers with expertise in palliative care, a chaplain who has provided spiritual care for several years, and a nurse practitioner who is the leader of the nursing staff in the Palliative Care Unit. The daily training course began with a series of 1-hour lectures on the roles of the physician, nurse, psychologist, social worker, and chaplain, followed by a 6-hour session at the bedside of terminally ill patients and their families, and ended with an interactive discussion with experienced palliative-care consultants in the evening.

Instrument

The investigators constructed the instrument in accordance with Taiwanese palliative care characteristics, after careful review of the literature in this area.[8,9] The instrument included demographic information about the participants, knowledge of palliative care, and beliefs relating to ethical decision-making. Demographic data included age, sex, school, religion, and whether or not family or friends have had cancer or have received palliative care.

Table 1. Schema of a 1-week palliative care curriculum

Time		Day 1	Day 2	Day 3	Day 4	Day 5
08:00–09:00	Lectures	Pre-test; orientation	Nursing in palliative care	Spiritual care in palliative care	Psychologist in palliative care	Physician in palliative care
09:00–12:00	Bedside learning: patient care and teamwork					
13:00–16:00	Bedside learning: patient care and teamwork				Team meeting: 13:00–15:00	Bedside learning
16:00–17:00	Case presentation and discussion with palliative care physicians					Post-test

There were 32 statements relating to knowledge of palliative care. The participants were asked to answer "true", "false", or "not sure", in response to the description in each statement. Each accurate answer was worth 1 point and the answer of not sure was not counted. The reliability index calculated by the Kruder–Richardson Formula 20 was 0.79. According to item discrimination and difficulty analysis, 18 items were retained for analysis, and their Kruder–Richardson index of reliability was 0.71. Of the 18 retained for analysis, six items were related to theoretical understanding of palliative care, and the other 12 were concerned with knowledge of clinical management. The students were asked to rate the beliefs about ethical decision-making on a 5-point Likert scale from 1, "strongly disagree" to 5, "strongly agree". The instrument was validated by an expert for content validity. Three medical students completed the questionnaire in order to establish face validity.

Statistical analysis

Data management and statistical analysis were performed using SPSS version 12.0 (SPSS Inc., Chicago, IL, USA). The demographic data were described with frequency, mean, and standard deviation. Wilcoxon signed rank test was used to test the improvement in palliative care knowledge after educational intervention (pre-test *vs.* post-test). The changes in beliefs toward the common ethical issues in palliative care were assessed with the paired *t* test. Analysis of variance (ANOVA) was used to test the differences in knowledge and beliefs between subgroups. Univariate analysis was performed on the improvement of beliefs about ethical issues and the factors potentially contributing to improvement, by independent *t* tests, χ^2 tests, and one-way ANOVA. Logistic regression was carried out to determine the adjusted values of the factors relating to the improvement in ethical beliefs. Statistical significance was assumed when $p < 0.05$.

Results

Demographic characteristics

Demographic characteristics of the participants are shown in Table 2. A total of 118 medical students completed the questionnaires, with a 100% response rate both before and after the educational program. The participants were mainly men (61.9%) and students of National Taiwan University (78.7%). For religious beliefs, 50.8% of the respondents did not have a religious belief, while 18.6% were Buddhists. Only a small proportion of the students (12.7%) reported that their friends or family had received palliative care.

Knowledge of palliative care

Participants showed a 14.7% absolute improvement in palliative care knowledge, with a total mean score of 9.97 (rate of correct response to the questions, 55.4%) pre-test, and 12.73 (rate of correct response, 70.1%) post-test (range, 0–18; $z = 7.790$; $p < 0.001$). The medical students had greater knowledge scores for items relating to theoretical understanding of palliative care, with a mean score of 4.09 (rate of correct response,

Table 2. Characteristics of the 118 students

	n (%)
Sex	
Male	73 (61.9)
Female	45 (38.1)
Age (yr)	18–30 (median, 20)
School	
College of Medicine, NTU	94 (79.7)
China Medical University	22 (18.6)
Chung-Shan Medical University	2 (1.7)
Religion	
None	60 (50.8)
Buddhist	22 (18.6)
Daoist	3 (2.5)
Christian	11 (9.3)
Family or friends have had cancer	
Yes	66 (55.9)
No	52 (44.1)
Family or friends have received palliative care	
Yes	15 (12.7)
No	101 (85.6)

NTU = National Taiwan University.

68.2%) and 4.78 (rate of correct response, 79.7%; range, 0–6; $z = 4.075$; $p < 0.001$) before and after the curriculum, respectively. A greater absolute improvement (17%) in clinical management was noted, with a mean score of 5.88 (rate of correct response, 49.0%) before the curriculum and 7.95 (rate of correct response, 66.2%) after the curriculum (range, 0–12; $z = 7.119$; $p < 0.001$). The scores for palliative care knowledge did not differ significantly between different schools, religions, or ages.

Theoretical understanding

The mean rates of correct responses to the statements on theoretical understanding of palliative care pre- and post-test are listed in Table 3. The students showed significant improvements for five out of six statements. The statement that did not show improvement was "Men generally reconcile their grief more quickly than women" (pre-test, 66%; post-test, 63%). The statement "The palliative care team provides bereavement support for family after the patient's death" had the highest rate of correct responses at pre-test (87%) and post-test (100%). The statement

Table 3. Improvement in palliative care knowledge in theoretical understanding after the curriculum in the 118 students

	Rate of correct response (%)		*p*
	Pre-test	Post-test	
1. Palliative care is appropriate only in situations where there is evidence of a downhill trajectory or deterioration	34	51	0.005*
2. Men generally reconcile their grief more quickly than women	66	63	0.516
3. The philosophy of palliative care is compatible with that of aggressive treatment	62	75	0.009*
4. The palliative care team actively manages pain and other symptoms of terminal patients	80	96	<0.001†
5. The palliative care team provides bereavement support for family after the patient's death	87	100	<0.001†
6. Palliative care is an alternative for the curative non-responsive patient	81	94	0.002*
Mean	68.1	79.7	<0.001†
Total	4.09	4.78	

**p < 0.01, †p < 0.001, Wilcoxon signed rank test.*

Table 4. Improvement in palliative care knowledge in clinical management after the curriculum in the 118 students

	Rate of correct response (%)		*p*
	Pre-test	Post-test	
1. Morphine is the standard used to compare the analgesic effect of other opioids	50	70	<0.001*
2. The extent of the disease determines the method of pain treatment	72	80	0.117
3. Adjuvant therapies are important in managing pain	93	97	0.059
4. During the last days of life, the drowsiness associated with electrolyte imbalance may decrease the need for sedation	32	55	<0.001*
5. Drug addiction is a major concern when morphine is used on a long-term basis for pain management	14	37	<0.001*
6. Individuals who are taking morphine should also follow a bowel regimen	52	86	<0.001*
7. During the terminal stages of an illness, drugs that can cause respiratory depression are appropriate for the treatment of severe dyspnea	24	32	0.086
8. At high doses, codeine causes more nausea and vomiting than morphine	24	32	0.050†
9. The loss of a distant or contentious relationship is easier to resolve than the loss of one that is close or intimate	29	42	0.019†
10. General malaise is the most common symptom of advanced cancer patients; both pharmacological and non-pharmacological therapy are important	83	94	0.005‡
11. Morphine is commonly used in cancer pain and should follow the rules of by mouth, by the clock and by ladder	43	81	<0.001*
12. Support is an important treatment for dyspnea in terminal patients	72	88	<0.001*
Mean	49.0	66.3	<0.001*
Total	5.88	7.95	

**p<0.001, †p<0.05, ‡p<0.01, Wilcoxon signed rank test.*

"Palliative care is appropriate only in situations where there is evidence of a downhill trajectory or deterioration" had the lowest rate of correct responses at pre-test (34%) and post-test (51%).

Knowledge of clinical management

Table 4 shows the scores of 12 items regarding knowledge of clinical management in palliative care. Students demonstrated a significant improvement for eight out of 12 items according to the Wilcoxon signed rank test. The students had a high knowledge level for the following three items: "Adjuvant therapies are important in managing pain" (pre-test, 93%; post-test, 97%); "General malaise is the most common symptom of advanced cancer patients; both pharmacological and non-pharmacological therapy are important" (pre-test, 83%; post-test, 94%); and "Support is an important treatment for dyspnea in terminal patients" (pre-test, 72%; post-test, 88%).

Particularly low scores were noted for the following three items: "Drug addiction is a major concern when morphine is used on a long-term basis for pain management" (pre-test, 14%; post-test, 37%); "During the terminal stages of an illness, drugs that can cause respiratory depression

Table 5. Beliefs relating to common ethical decisions before and after the curriculum in the 118 students

	Pre-test	Post-test	*t*	*p*
1. Truth-telling is helpful to a good death	4.22	4.54	–4.666	<0.001*
2. Discharge planning and home care is ethical for terminal patients	4.37	4.52	–2.429	0.017†
3. Artificial nutrition and hydration have no benefit for terminal patients	3.69	3.64	0.267	0.790
4. It is ethical to give sedation for refractory symptoms in terminal patients	3.78	4.16	–0.926	0.356

*$p < 0.001$; †$p < 0.05$.

are appropriate for the treatment of severe dyspnea" (pre-test, 24%; post-test, 32%); and "At high doses, codeine causes more nausea and vomiting than morphine" (pre-test, 24%; post-test, 32%).

The students showed greater absolute improvements for items relating to opioid use, such as: "Morphine is commonly used in cancer pain and should follow the rules of by mouth, by the clock and by ladder" (which improved by 38% from pre-test to post-test); "Individuals who are taking morphine should also follow a bowel regimen" (which improved by 34%); and "Drug addiction is a major concern when morphine is used on a long-term basis for pain management" (which improved by 23%).

Beliefs relating to ethical decision-making

Table 5 shows the strength of the students' beliefs (measured using a 5-point Likert scale) relating to the four common ethical decision-making items, and the comparisons between pre- and post-test scores (a high belief score indicates that more students belief that the statement is true). Medical students had the highest level of belief for the issue "Discharge planning and home care is ethical for terminal patients" (mean, 4.37; range, 1–5) at pre-test and "Truth telling is helpful to a good death" (mean, 4.54; range, 1–5) at post-test. The participants showed significant improvements between pre- and post-test scores for these two issues. The participants had the lowest belief score for the issue "Artificial nutrition and hydration have no benefit for terminal patients" either before (mean, 3.69; range, 1–5) or after (mean, 3.64; range, 1–5) the educational program.

Comparisons of beliefs between demographic characteristics revealed that students who had family members who had died from cancer agreed more with the belief about artificial nutrition and hydration (mean difference ± standard deviation, 0.89 ± 0.34). Factors potentially contributing to the improvement of beliefs about ethical decision-making, such as demographic characteristics, knowledge scores of principles, and clinical knowledge scores of skills, were analyzed by univariate and stepwise logistic regression analysis. These factors did not appear to be significant predictors of improvements in beliefs about ethical decision-making.

Discussion

To the authors' knowledge, this study is one of the first to assess the effects of a 1-week, multimodal, palliative-care curriculum in the Asia-Pacific region. Medical students showed significant improvements in palliative care knowledge and beliefs about ethical decision-making after participating in the curriculum. The students showed a 14.7% improvement in knowledge from pre-test to post-test, a finding similar to those of previous studies.[6,10]

The majority of medical students in Taiwan did not have adequate palliative care knowledge (mean rate of correct response, 55.5% pre-test) before an end-of-life curriculum. They had

especially low scores for questions relating to clinical management, but showed improvement after the curriculum. Previous studies have demonstrated similar findings.[11,12] The modest improvement in theoretical understanding after educational intervention may have been the result of the high scores before the curriculum. Compared with primary care physicians and district nurses in Taiwan,[12,13] students had lower scores in theoretical understanding principles (students, 79.8%; physicians, 92.7%; nurses, 88.5%), but higher scores in knowledge of clinical management (students, 66.3%; physicians, 61.0%; nurses, 43.0%) after the curriculum. The comparisons also demonstrated the effect on the promotion of clinical management knowledge by the curriculum.

About one half of the participants responded correctly to the concept of early intervention and suffering prevention, which is detrimental to quality of end-of-life care. Before the curriculum, only 43.2% of participants knew that opioid use, which relies on the World Health Organization stepwise approach to cancer pain, should be given preferably orally and around the clock. Most of the students thought that addiction would be a major problem when using opioids for cancer pain control. It is worth reinforcing these concepts for future education.

Truth disclosure to terminally ill patients is advocated and practiced in Western countries but is thought to have a negative psychological impact on patients in Oriental societies. A study in Taiwan has shown that truth disclosure is associated with a good death in terminal cancer patients.[14] The majority of students also strongly agreed that truth disclosure is helpful to a good death, which is consistent with the result of the previous study. Continuing education on truth disclosure in palliative care should be emphasized.

In Taiwan, the majority of terminal patients expect to be taken care of at home, but eventually stay in the hospital at the end of their life. The barriers to staying at home include not being able to manage emergency medical conditions, having an insufficient number of caregivers, and the comfort and convenience of staying in the hospital.[15] Most students believe that transferring terminal patients from the hospital to a home care program is ethically appropriate, although it is usually difficult. Should palliative care be provided at home, then family caregiver education should be emphasized to overcome barriers.

The study also found that students had the lowest level of belief for the statement "Artificial nutrition and hydration have no benefit for terminal patients". The result is similar to that of a previous study.[16] The finding suggests that patients and medical students in Taiwan still believe that ANH can prevent patients from starving to death. However, a study in the United States has shown that medical students had the most significant improvement on questions relating to this issue.[6] The discrepancy may be explained by cultural differences. It is worth mentioning that students who had family members who died of cancer had a higher level of belief for the statement on ANH. With personal experience, students tended to believe that ANH is not beneficial to terminal patients.

Some studies in Taiwan have revealed that most medical professionals and families feel that it is ethically acceptable to use sedation in terminal cancer patients for refractory symptoms;[17,18] however, the participants had a relatively low level of belief in this issue prior to the curriculum. This may have been because of unfamiliarity with palliative sedative therapy. Increasing knowledge and clinical experience about palliative sedative therapy will help students to make an appropriate decision for the patient.

As the four common ethical decision-making issues crucially influence the quality of care in hospices,[19] it is important for physicians to have positive beliefs and adequate skills to deal with them. The study also explored the underlying factors that contribute to the improvement of ethical beliefs, which would be helpful in designing a better curriculum for end-of-life care. Knowledge scores, improvement from before to after the curriculum, and personal characteristics were not related to ethical-belief improvement.

As a result, improvement in ethical beliefs may have occurred because of the total effect of the curriculum. Some factors were not identified by the evaluation instrument in the present study, such as clinical role model observation and interaction with patients.

Certain caveats should be mentioned in relation to the present study. The participants participated voluntarily and there was no control group, thus maturation and selection bias have to be considered. The evaluation was limited to the 1-week curriculum design period. A longitudinal study would allow for a better understanding of the information retention pattern of the knowledge and beliefs relating to ethical decision-making in the subsequent years of medical training, including residency and clinical practice.

The combination of lectures by interdisciplinary staff, bedside patient care, and interactive discussion is an effective curriculum to improve medical students' knowledge and beliefs about ethical decision-making with regard to end-of-life care. Clinical management of symptoms, especially pain control, and the issue of ANH should be emphasized in undergraduate curricula throughout residency training.

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