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Improved competence after a palliative care course for internal medicine residents

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Residents report that they received inadequate teaching in palliative care and low levels of comfort and skills when taking care of dying patients. This study describes the effects of a problem-based palliative care course on perceived competence and knowledge in a representative Dutch cohort of residents in internal medicine. Before and after the course, we carried out a questionnaire survey and knowledge test in 91 residents. The results show that many residents felt they had limited competence or were incompetent when taking care of patients in the palliative care phase. This was particularly true with respect to communication concerning euthanasia and physician-assisted suicide or hastened death (86% and 85% respectively reported limited competence or incompetence). Participants reported that they received inadequate training in palliative care and believed that specific education would make them feel more competent. The number of times that residents were engaged in palliative care situations and the years of clinical experience had a positive influence on perceived competence. Participating in the course improved perceived competence and knowledge in palliative care. No correlation was found between perceived competence and knowledge of palliative care. *Palliative Medicine* (2009); **23**: 360–368

Key words: competence; knowledge test; medical education; palliative care; residents

Introduction

A government report, issued in 1996, concluded that the level of palliative care in the Netherlands was suboptimal and that formal and proper education in palliative care was lacking.[1] At that time, the Netherlands were criticised for their liberal euthanasia policy; it was stated that the Dutch policy was, in fact, reflecting deficiencies in proper palliative care.

According to recent international reports,[2–6] inadequate training in palliative care appears to be a general problem, existing in several countries including the Netherlands, both at the level of medical school and at the level of specialist training. To improve the level of palliative care in the Netherlands, the government has set up educational programmes at different levels of the Dutch health care system. One of these programmes was specifically aimed at medical specialists and as a start, introduced to residents in internal medicine.

Residents are often in the front line when it comes to dealing with terminally ill patients and their relatives and they are deeply affected by the deaths of patients for whom they care.[7] In general, residents reported that they received inadequate teaching in terminal care[2,8] and they also reported low levels of comfort and skills when taking care of dying patients.[2,9–11] Surveys among medical students[12] and general practitioners[13,14] suggest that training in palliative care results in an improved feeling of being competent when taking care of the dying. Limited information is available regarding the effect of a palliative care educational program on the level of perceived competence of residents or their knowledge in palliative care.

We chose a problem-based palliative care course, following the advise from The European Association of Palliative Care and the Central College of Medical Specialists

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of the Netherlands. Both groups stated that medical education (in palliative care) should be based on e.g. experiential learning, case study, small group discussions and self study of the literature.[15,16]

Methods

Participants

Residents in internal medicine (hereafter referred to as residents) who worked in one of the two hospitals in Nijmegen, the Netherlands (the Radboud University Nijmegen Medical Centre a large university hospital with 953 beds, and the Canisius Wilhelmina Hospital, a teaching hospital with 653 beds), participated in the study. In the Netherlands, the specialist training for internal medicine takes 6 years. Before officially starting the training, many residents have already worked in a Department of Internal Medicine as a resident "not in training." In fact in teaching hospitals, such residents perform the same work as a resident in training. Some of the residents in our study were in training to become a lung specialist or a heart specialist. Because these work during the first 2 years of their training as an internal medicine resident, they could also participate in the palliative care program.

During the whole study period, which ran from September 2001 till November 2002, the total amount of residents in the two hospitals changed, with a considerable number each year coming in or leaving because of their training schedule. In total, 91 residents worked in this period in the two hospitals.

Pre-course questionnaire

In collaboration with a psychologist (GB) a multiple-choice questionnaire was developed. Questions were partially derived from existing, reported questionnaires,[4,9,10,17] and organized into the following sections: demographics, previous training in palliative care at medical school, competence in delivering palliative care, problems encountered while providing palliative care, personal experience in palliative care situations and educational needs. The 18 questions about competence were organised as follows. First, a situation was described as follows: "I tell a patient that his disease is incurable and that the disease is progressive" then four questions were asked (see Box 1). The range of the answering categories was fixed for statistical purpose. In September 2001, the questionnaire was sent to the full population of residents ($N = 64$) working in the two large teaching hospitals at that moment (see Figure 1). Non-respondents were approached again after 1 month by a reminding letter, by e-mail or by a personal approach.

In 2008 we performed a new survey to investigate whether the level of perceived competence in palliative care under residents had changed between 2001 and 2008. In august 2008, we asked 12 residents in internal medicine to fill in the original pre-course questionnaire.

Box 1 Example of a question about competence and previous training in palliative care

"I tell a patient that his disease is incurable and that the disease is progressive"

a. Since graduating medical school, I've been in this situation:
1. Never
2. 1–4 times
3. 5–10 times
4. 11–20 times
5. >20 times

b. How competent did you feel in this situation?
1. Sufficiently competent
2. Limitedly/incompetent

c. Have you been prepared for situations like this in your medical education so far?
1. Yes
2. No

d. Would you like to receive training on this subject?
1. Yes
2. No

Pre-course knowledge test

A knowledge test was designed to measure knowledge on palliative care and to assess the effect of the problem-based palliative care course on this issue. Each teacher who participated in the course prepared multiple-choice questions about topics that were part of their educational programme. The test consisted of 39 questions and had a maximum score of 43 points. In April 2002 before the start of the course, the knowledge test was sent out to all the 70 residents working at that moment in the two hospitals.

Problem-based palliative care course

The topics for the problem-based palliative care course were based on the results of the questionnaire and the literature search (see for the topics Table 1). Problem-based education was already in use since 1999. The course included a weekly 2-hour meeting in which – based on a patient case – problems were discussed with a professional working in the field of palliative care. One week before the meeting the patient case with the questions and literature references was sent to the residents who ought to prepare

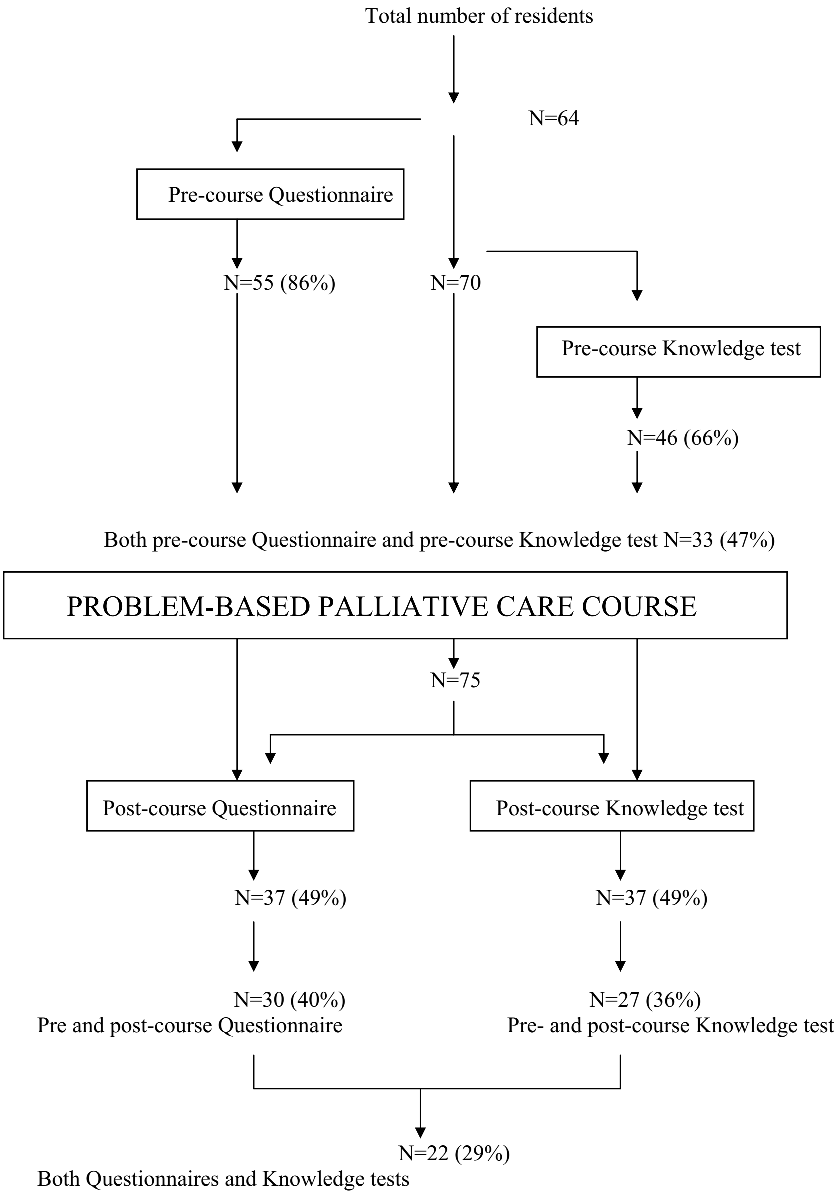

Figure 1 Overview of the residents during the study period May 2001 till November 2002.

the questions at home. The whole palliative care program ran for eight educational meetings. In every session, different aspects of palliative care are raised, from symptom control to attitudes, ethics and pharmacology. The course ran from May 2002 till September 2002.

Post-course questionnaire and knowledge test

In November 2002, 2 months after the course, a second questionnaire and knowledge test was send out to all 75 residents working in the two hospitals at that time. The post-course questionnaire contained the same questions about competence as the pre-course questionnaire and additional questions to evaluate the course. For the post-course knowledge test, the same 39 questions were asked but in an alternate sequence.

Data analysis

Data were analysed using the SPSS programme version 12.0. Descriptive statistics were used to explore the data (median and ranges). The chi-square test, the cross tab procedure and the independent t-test were used to test between-group differences. Paired t-testing was performed to detect interpersonal differences. Correlations were calculated using Pearson's correlation test or Spearman's rank correlation test. Results are expressed as mean ± SD.

Table 1 The content of the problem-based palliative care course and the number of residents participating

Topic of the session	Residents participating
What is palliative care?	
Definition, when does it starts, how is it organized difference between curative and palliative care talking with a patients about palliative care role of the doctor decisions about limited treatment/stop treatment working in palliative care: impact on the doctor	28
The patient with breathlessness:	
How to handle dyspnoea, rattle, vena cava superior syndrome, pleura fluid, coughing, panic fluid treatment in palliative care death scenario: death by suffocating	30
The patient with abdominal pain:	
How to handle: obstructions of the intestinal, nausea, vomiting, mouth problems, hiccup, ascites, urine retention, anorexia, constipation, dehydration, death scenario: bowel obstruction	31
The patient with neurological symptoms:	
How to handle: raised intracranial pressure, cerebral metastasis, change in personality, invalidity, threat of spinal cord lesion, decubitus, terminal ALS, CVA death scenario: cerebral death	53
The patient with pain:	
Pain diagnostics, treatment options invasive and non- invasive. morphine use, psychological aspects of pain death scenario: untreatable pain, dying as a result of the medication used, palliative sedation	27
The confused patient	
how to handle: delirium, fear, depression, fever hyper calcaemia, coping problems, care for the family, bereavement, culture and religion aspects of palliative care	21
The patient with organ failure	
how to handle, liver or kidney failure, fatigue, itching, anorexia, feeding, pharmacokinetic aspects of liver and kidney failure, euthanasia, the last 24 hours.	26
Acute problems in palliative care	
acute bleeding, limited treatment, do not resuscitate decisions, death certification, ethical and legal aspects of palliative care autopsy, moral deliberation care for the carers	23

Results

Pre-course questionnaire and knowledge test

Demographics

Of the pre-course questionnaire, 55 of 64 were returned (response rate 86%). Reasons for non-response were maternity leave ($n = 2$) or unknown ($n = 7$). Mean age of the responders was 30.3 ± 3.8 years (range 25–43 years); 32 (58%) were female; 49 (89%) were officially included in a training program, mostly for internist. Mean number of years working as a resident in clinical practice was 3.6 years (range 0.17–11 years).

Residents' perceived competence in providing palliative care

Residents felt limited competent or incompetent in 7.7 ± 4.5 (43%) and competent in 10.3 ± 4.5 (57%) of the 18 outlined situations about palliative care (see Table 2). Residents felt especially uncomfortable in communicating with patients and their relatives concerning euthanasia and physician-assisted suicide/hastened death (86% and 85% reported limited competence or incompetence, respectively). In addition, residents did not feel competent in discussing a death scenario with a patient (66%), in treating a patient of their own age (56%), in talking to terminally ill patients about their gloominess (56%), fears (47%), and fatigue (37%) and in pain management (40%).

The level of perceived competence was not different between males and females and was not influenced by age (see Table 3).

In 2008, 11 of the 12 (92%) residents returned the questionnaire. The demographic details (data not shown) were comparable to those of the pre-course questionnaire in 2001. The new survey shows that the current group of residents scores almost identical to the group of 2001. Residents of today feel as limitedly competent or incompetent in several situations, in which they have to provide palliative care, as the residents in 2001.

Residents who were better acquainted with situations involving palliative care had a significantly higher competence score compared with the ones with less experience in these situations (see Table 3). In approximately half of the situations listed in the questionnaire, competence was higher with residents who had been engaged in that specific situation more than 10 times, compared with those who were less than 10 times engaged (see Table 4). There was a strong correlation between feeling limitedly competent or incompetent and having less experience within a specific palliative care situation ($r = -0.87$, $P = 0.00$, see also Table 2).

Overall, residents who had more years of clinical experience (>3.5 years) perceived themselves more competent (see Table 3). This relationship was most pronounced with respect to pain management, limited treatment decisions, supervising a medical student and treating severe dyspnoea (all $P < 0.05$). There was also a correlation between years of clinical experience and the total number of times that residents had been engaged in palliative care situations ($r = 0.60$, $P = 0.00$).

Role of previous training in palliative care

Most residents reported that they had not received adequate training for managing the described palliative care

Table 2 The pre-course questionnaire: responses on the questions about feeling competent (times engaged in the situation and prepared for this)

How many times engaged in this situation	Limitedly/incompetent Pre-course Questionnaire n (%)	Mean answer Question a[a]	Inadequately prepared during medical training n (%)
I talk to a patient and his family about euthanasia	43 (86)	2.00	47 (92)
I talk to a patient who asks for physician assisted suicide or a hastened death	44 (85)	2.24	49 (93)
I tell a patient what dying might be like	33 (66)	2.73	45 (88)
I treat a patient of my own age or younger, who's in the terminal phase	27 (56)	2.18	41 (80)
I talk to a terminal patient about his gloomy mood	28 (56)	2.64	44 (85)
I talk to a patient, who is in the palliative phase, about his fears	25 (47)	3.24	47 (87)
I ask the family permission for organ donation	22 (44)	2.96	40 (74)
I take care of the pain management of a patient in the palliative phase	21 (40)	4.26	32 (60)
I talk to a terminal patient about his symptom of fatigue	19 (37)	2.98	36 (69)
I supervise a medical student with his experiences with terminally ill patients	17 (34)	2.69	44 (86)
I tell the patient he will soon die	15 (29)	3.59	41 (75)
I talk to a patient about the choice to stop treatment or not starting a treatment	14 (28)	3.76	43 (63)
I guide a terminal patient with severe dyspnoea	14 (26)	3.49	31 (57)
I tell a patient that his disease is incurable and that the disease is progressive	10 (20)	4.15	33 (60)
I ask the family permission to do an autopsy	10 (19)	4.28	36 (67)
I declare a patient dead	5 (9)	4.37	30 (56)
I fill out a death certificate	5 (9)	4.48	40 (74)
I talk to the family shortly after the death of a patient	4 (8)	4.35	33 (62)

[a] Since graduating medical school I've been in this specific palliative care situation: 1: never; 2: 1–4 times; 3: 5–10 times; 4:11–20 times or 5: >than 20 times)

situations. Ninety-four percent of the respondents thought that more education would render them more competent in taking care of terminally ill patients. Interestingly, 86% of the residents reported that they had faith in their own ability to take care of a palliative patient; at the same time, 66% thought that many of their colleagues would have difficulties in handling these patients. The results of the questionnaire of 2008 fit in with the results of 2001.

Role of personal experience with palliative care

Twenty four (44%) of the residents had an experience with palliative care and death in their personal life, almost all stated that these experiences had positively influenced their work in the palliative care setting. Although residents who had personal experiences with palliative care seemed to feel a little more competent, these differences did not attain statistical significance (number of situations they felt competent in: 11.3 ± 4.4 *vs.* 9.5 ± 4.5, independent t-test P = NS).

Relationship between competence and knowledge

The pre-course knowledge test was sent out to 70 residents and returned by 46 (response rate 66%). Of these 46, 33 (47%) had also responded to the pre-course questionnaire on competence. The mean score of the 46 residents that filled in the pre-course knowledge test was 20.8 ± 3.0

Table 3 Influence of gender, age, years of clinical experience and times engaged in palliative care situations, on the level of perceived competence of all residents that filled in the pre-course questionnaire ($n = 55$)

Grouping variable	All ($n = 55$)	Mean Competence	SD	P value Group 1 vs 2
Group 1: male	23	10.6	4.12	0.72
Group 2: female	32	10.1	4.76	
Group 1: ≤30 years	28	9.32	4.50	0.10
Group 2: >30 years	27	11.3	4.29	
Group 1: clinical experience ≤3.5 years	28 ($n = 54$)	8.64	4.35	0.01
Group 2: clincal experience >3.5 years	26 ($n = 54$)	12.0	4.05	
Group 1: mean answer question a[a] ≤median	28	8.29	3.78	
Group 2: mean answer question a[a] >median	27	12.4	4.2	0.00

[a] Since graduating medical school I've been in this specific palliative care situation: 1: never; 2: 1–4 times; 3: 5–10 times; 4: 11–20 times or 5: >20 times (median is 3.5)

Table 4 Relation between perceived competence and times engaged in a specific palliative care situation in the pre-course questionnaire ($n = 55$). Expressed as absolute numbers (percentage) of residents

Question	Engaged ≤10 times competent	Engaged >10 times competent	χ^2	*P* value
I tell a patient that his disease is incurable and that the disease is progressive	18 (16)	33 (65)	9.87	0.00
I talk to a patient about the choice to stop treatment or not starting a treatment	10 (20)	27 (53)	4.03	0.05
I tell the patient that soon he is going to die	11 (22)	25 (49)	7.90	0.01
I tell a patient what dying might be like	5 (10)	12 (24)	15.4	0.00
I talk to a patient who asks for physician assisted suicide or a hastened death	5 (10)	3 (6)	4.69	0.03
I talk to a patient and his family about euthanasia	4 (8)	3 (6)	9.76	NV
I declare a patient dead	8 (15)	40 (76)	5.17	NV
I talk to the family shortly after the death of a patient	7 (14)	40 (78)	15.8	NV
I ask the family permission to do an autopsy	9 (17)	34 (64)	0.38	0.54
I ask the family permission for organ donation.	11 (22)	17 (34)	11.4	0.00
I fill out a death certificate	6 (11)	42 (79)	7.25	NV
I supervise a medical student with his experiences with terminally ill patients	21 (42)	12 (24)	1.87	0.17
I take care of the pain management of a patient in the palliative phase	4 (8)	28 (53)	3.35	0.07
I talk to a patient, who is in the palliative phase, about his fears	11 (21)	17 (32)	7.25	0.01
I treat a patient of my own age or younger, who's in the terminal phase	16 (33)	5 (10)	4.37	NV
I guide a terminal patient with severe dyspnoea	14 (26)	25 (47)	7.53	0.01
I talk to a terminal patient about his gloomy mood	14 (28)	8 (16)	0.76	0.38
I talk to a terminal patient about his symptom of fatigue	15 (29)	17 (33)	5.06	0.02

NV, not valid due to low numbers.

(range 13–26). In the group of residents that filled in both the pre-course questionnaire and knowledge test we found no correlation whatsoever between level of competence and level of knowledge ($r = 0.03$, $P =$ NS). In addition, when separating this population in a low competent (0–10 times competent within the 18 situations, n = 15) and a high competent group (11–18 times competent, n = 18), there was no difference between both groups in the knowledge score (21.5 ± 2.3 and 20.7 ± 3.4, $P =$ NS).

Post-course questionnaire and knowledge test

Effect of the problem-based palliative care course on competence

A total of 58 (83%) residents followed one or more of the eight sessions of the palliative care course, mean number of sessions followed was 3.7 ± 1.9. After the course, perceived competence increased. Amongst the 18 situations listed, the mean number in which residents reported they felt competent increased from 10.8 ± 4.3 (60%) to 13.1 SD ± 3.8, n = 30, $P = 0.00$). The results of the two questionnaires were correlated ($r = 0.52$, $P = 0.00$). The increase in competence occurred in all palliative care situations, except for the discussion of fatigue with a terminal patient.

The residents that filled in both questionnaires (n = 30, 40%), followed a mean of 3.7 ± 2.6 (46%) of the total of eight sessions. The group that followed less than three sessions of the courses appeared more competent and more experienced in palliative care situations at baseline (data not shown). The more sessions of the course were followed the larger the increase in perceived competence.

Role of increasing experience with palliative care and competence

The experience of residents with palliative care situations also increased significantly between the two questionnaires: the mean of the answers on all 18 *a*-question (see Box 1) increased (from 3.5 ± 0.9 to 3.9 ± 0.7, $P = 0.00$). No correlation was found between the change in experience with a palliative care situation and the change in competence ($r = 0.06$ $P =$ NS).

Effect of the problem-based palliative care course on knowledge

Thirty-seven of the 75 residents filled in the post-course knowledge test (response rate 49%), 27 residents filled in both knowledge tests. After the course, knowledge concerning palliative care increased (mean score from 20.5 ± 3.2 to 23.3 ± 3.52, n = 27, $P = 0.00$). There was no correlation between the result of the knowledge test and the amount of experience within palliative care situations ($r = -0.05$). Furthermore, there was no correlation between the individual change in knowledge and the individual change in competence ($r = -0.28$, $P =$ NS).

Discussion

This study reports on the competence and knowledge level in palliative care of residents training in internal medicine in the Netherlands and the effect of problem-based education on these items. The main findings of our study are that residents felt limitedly competent or incompetent in several areas concerning palliative care, with the reported level of competence not being associated to the level of knowledge. Both competence and knowledge improve after a problem-based palliative care course.

The first conclusion is based on the results of the first questionnaire, in which residents in a substantial number of palliative care situations report feeling limitedly competent or incompetent. So far, only few studies have reported on perceived competence of residents with respect to palliative care, but those that are available are in agreement with our findings. Farber, *et al.*[14] surveyed 972 internists and family practitioners and concluded that although these physicians do provide palliative care, they feel that their skills are lacking within certain areas. Low levels of comfort and skills concerning important aspects of palliative care were reported with residents,[10,11,18] with one third of the residents rating themselves as "not at all" or only "slightly" at ease in caring for a dying patient.[19] On a survey in 173 internal medicine and surgical residents, 50% of them felt "not at all" or "slightly" confident in their ability to take care of dying patients.[9] The latter findings are somewhat in contrast to the results in our study in which almost all residents stated that they had faith in their own ability to take care of a palliative patient, although this is rather contradictory to the fact that residents do feel limitedly competent or incompetent in many of the situations were they have to provide palliative care. A potential explanation for these findings is that residents find it hard to confess that they are not (yet) sufficiently skilled in some parts of their work. In line with this notion is the finding that two third of the residents believe that many colleagues do have difficulties in taking care of patients in the palliative phase.

Which factors determine the level of perceived competence? In our present study, residents consider that specific education would give them a higher level of competence. Other studies show that prior palliative care training positively affects perceived competence or comfort level [4,14] and that residents believe that they have not received enough training in palliative care to feel competent.[2,6,8,13]

It is disturbing to see that 34% of the residents feel limitedly competent or incompetent in supervising a medical student involved with terminally ill patients. The death of a patient can have a strong emotional impact on doctors[7] and may even have more impact on medical students. Previous research suggests that unresolved emotional issues can be a source of psychological distress.[20] In our opinion it is very important that medical students and residents are coached in their experiences regarding terminally ill patients. Redinbaugh, *et al.* already pointed out that "dealing with death" is a major gap in the clinical education of residents.[7]

We found no effect of gender, age or personal experiences with palliative care on the level of perceived competence. In contrast, Charlton, *et al.* found higher ratings in perceived abilities in older and male doctors.[13] Also Kvale, *et al.* reported that younger residents (<30 years) were more uncomfortable with the care of dying patients.[21] This could be explained by the difference in clinical experience between the residents in the study group of Kvale, *et al.* and the residents of our group. The mean number of years of clinical experience of Kvales' group is assumed to be lower than our group. The maximum years of clinical experience in Kvales' group was 3 years (with a mean of 1.9 years), whereas our study group had a clearly higher total mean (3.8 years) and the mean years of clinical experience in our group residents of 30 years or younger was already 1.8 years. The results of Weissman, *et al.* confirm this: they found that the self-reported competence of students, interns and residents increased with their level of training.[22]

In our study, we separated the effect of years of clinical experience and the experience in specific palliative care situations. Similar to the findings of other studies,[9,11,19] we found that residents with more (clinical) experience felt more competent. In addition, and unique in our study is the finding that the level of competence in a palliative care situation strongly correlates with how often residents have been engaged in that situation. Learning by doing apparently counts strongly for palliative care as well as personal experience, which adds to the level of competence.

Previous reports, which state that years of clinical experience correlate with competence, may thus be explained by the increasing number of involvement in specific palliative care situations.

Although discussing euthanasia and physician-assisted suicide are not components of a good palliative care treatment per se, these were nevertheless included in the palliative care situations because they are related to end-of-life care. As the results of the questionnaire shows, residents are not often confronted with these items and when they have to deal with it they do feel limitedly competent or incompetent.

In contrast to our expectations, we found no relation at all between level of knowledge and level of competence. These findings are in fact in accordance with earlier results of Clark, *et al.* who did not find a relationship either between results of a knowledge test and a self-rating score on comfort in taking care of a dying patient, in internal medicine house officers.[19] The lack of relation between knowledge and competence suggests that feeling competent is merely dependent on experience with specific situations or other skills like communication techniques than on knowledge. Alternatively, the test may not have been able to assess the specific knowledge necessary for acting competent in the described palliative care situations.

After the problem-based palliative care course, the residents reported to feel more competent, and that their knowledge had increased. The largest increase showed amongst those who followed most sessions. However, the pre-test competence in this group was lower. It can not be excluded that those residents that already had a higher score may not have improved after the education. Furthermore, the group that did not follow any course session also showed an increase in competence level. Our problem-based palliative care course ran only one time, because of a nationwide change in the scheme and organisation of the education for residents in internal medicine in 2002. The time left for palliative care education was reduced to one afternoon in 2 years, instead of the eight of our program. Thus the residents who filled in the pre-course questionnaire in 2008 have not received our problem-based palliative care program, and this fit in with the results of the recent questionnaire: they do not feel more competent then the residents in 2001.

Only a few other studies have evaluated the effect of a palliative care course for residents on knowledge[23–25] or measured the change in perceived competence.[12] Oneschuk, *et al.* found that knowledge in second-year family medicine residents of end-of-life care improved after a palliative care course.[24] Also after a palliative care training for critical care medicine trainees, the results on the knowledge test improved.[25] Another study found no significant effects on interns and senior internal medicine residents` attitudes towards or knowledge of end-of-life care after a palliative care course.[23] Their course consisted of a four weekly 1-hour small case based group discussion and may have been too limited in duration and follow-up to result in changes in competence.

This study describes the effect of our problem-based palliative care course. We cannot determine whether an alternative educational approach would have resulted in different outcomes.

Despite efforts to maximize the opportunity of residents to attend the courses, attendance was fair but not optimal. This may have been due to the workload of patient care. One potential solution would be to cluster all teaching sessions into one or two separate course days.

Limitations

Our study has limitations. We measured the perceived competence of residents, which is only a surrogate for behaviour. Evaluating the effect of the problem-based palliative care course on the actual behaviour of residents in palliative care situations would have been a more ideal approach; however, it is hardly attainable. No standardised instruments exist to measure perceived competence and knowledge of residents in aspects of palliative care and therefore, we had to make our own tests. This makes it difficult to compare our results with those of other studies. The response rate of the participants over time seems limited. The time between the first questionnaire and the second one was 1.5 year, and it should be emphasised that during such a period of time, marked changes occur in the group of residents. Some went on to work in another hospital or specialism for further training and could not be reached anymore; some had finished their training and started a professional career in another hospital. A few were not responding on the second questionnaire because of maternity leave.

On the other hand, we would like to stress that we have succeeded in including a large number of residents (30 participated in both questionnaires) and in 27 participants we obtained paired responses to the knowledge test.

Conclusions

Many residents feel limitedly competent or even incompetent when taking care of patients in the palliative phase of their life and their relatives. This is particularly true in communication regarding euthanasia and physician-assisted suicide or a hastened death. No correlation existed between perceived competence and knowledge of palliative care.

Participating in the problem-based palliative care course improves the perceived competence and knowledge in palliative care. Taken together our results indicate that improvement of residents' education in palliative care is necessary. A problem- and experience-based education course with the emphasis on dealing with dying may provide a good way to teach palliative care to residents.

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